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GERMINATION, SURVIVORSHIP, PRODUCTIVITY, AND COMPETITIVE ABILITY OF SIX NATIVE GRASS SPECIES FROM THE NORTHERN MIXED-GRASS PRAIRIE FOR USE IN PRAIRIE VEGETATION RESTORATION

BY
DEAN NERNBERG ©

A Thesis submitted to the Faculty of Graduate Studies and
Research in Partial Fulfilment of the Requirements for the
Degree of

MASTER OF SCIENCE
in
PLANT ECOLOGY

DEPARTMENT OF BOTANY

EDMONTON, ALBERTA
FALL 1994

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FACULTY OF GRADUATE STUDIES AND RESEARCH

The undersigned certify they have read, and recommend to the Faculty of Graduate Studies and Research for acceptance, a thesis entitled: GERMINATION, SURVIVORSHIP, PRODUCTIVITY, AND COMPETITIVE ABILITY OF SIX NATIVE GRASS SPECIES FROM THE NORTHERN MIXED-GRASS PRAIRIE FOR USE IN PRAIRIE VEGETATION RESTORATION, submitted by DEAN NERNBERG in partial fulfilment of the requirements for the DEGREE OF MASTER OF SCIENCE IN PLANT ECOLOGY.

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Date: June 6, 1994 D-day

ABSTRACT

Native prairie has been almost eliminated from the Canadian prairies. The only hope for the survival of it's integrity and diversity is long-term intensive management or restoration coupled with appropriate maintenance.

Restoration of a prairie landscape would benefit greatly from knowledge of: (1) existing environmental factors, (2) how they vary along gradients, (3) which plant species are most suitable for given environmental conditions, and (4) how these species interact.

To undertake restoration of northern mixed-grass prairie, I examined establishment capabilities of six major native grasses along a topographic gradient and how these species interact competitively along a moisture gradient. At five sites along a hillside catena at Last Mountain Lake National Wildlife Area, Saskatchewan, Canada, monoculture plots of six native grasses, one invasive exotic, and one "native" cultivar were planted. Competitive ability among five of the native grasses at three moisture levels was studied with a growth-room experiment using *Bromus inermis* as the reference competitor (phytometer).

A higher proportion of seeds germinated of mesophytic grasses (*Agropyron dasystachyum, A. trachycaulum, Bromus inermis*, and *Festuca hallii)* compared to xerophytic grasses (*Stipa comata, S. curtiseta, S. viridula*, and *S. viridula* (Lodorm)). The mesophytic grasses and *S. viridula* (Lodorm) all germinated the first spring. In the remaining xerophytic species, germination varied over two years from mainly in the first year in *S. curtiseta* (85%) to virtually all in the second year in *S. viridula* (90%).

Survivorship and productivity were lower in drier sites. Survivorship of xerophytic species was less affected by variations in moisture availability. Productivity was markedly reduced in the alkaline lowland, except for *A. trachycaulum*.

Irrigation hastened germination and had a positive influence on total germination and survivorship. Irrigation the first growing season reduced germination of *Stipa* spp. and productivity in *A. dasystachyum* and *A. trachycaulum* in the second year.

Hierarchical competitive ranking differentiated those which are stress-tolerant, often slower-growing, and less competitive (*Stipa curtiseta, S. comata*, and *Agropyron trachycaulum*), and those which are more productive, have a higher potential growth rate, and a greater competitive ability (*S. viridula* and *A. dasystachyum*). Competitive ability of all the native grasses increased with reduced moisture availability relative to the phytometer.

Planting mixtures are recommended and ecological attributes important to restoration or reclamation are listed.

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TABLE OF CONTENTS

PAGE

1. INTRODUCTION....1
   - 1.1 The Study System....3
   - 1.2 The Experimental Research....3
   - 1.3 Literature Cited....5

2. THE GERMINATION, SURVIVORSHIP, AND PRODUCTIVITY OF SIX NATIVE NORTHERN MIXED-GRASS PRAIRIE GRASSES ALONG A TOPOGRAPHIC GRADIENT....8
   - 2.1 Abstract....8
   - 2.2 Introduction....9
   - 2.3 Study Area....13
     - 2.3.1 Location....13
     - 2.3.2 Geology....13
     - 2.3.3 Soil....13
     - 2.3.4 Vegetation....15
     - 2.3.5 Site History....15
     - 2.3.6 Climate....15

   - 2.4 Methods....21
     - 2.4.1 Experimental Design and Treatments....21
     - 2.4.2 Study Species....21
     - 2.4.3 Seed Sources and Storage....24
     - 2.4.4 Site Preparation and Maintenance....24
     - 2.4.5 Planting....25
     - 2.4.6 Data Collection....25
       - 2.4.6.1 Climate....25
       - 2.4.6.2 Soil Moisture....25
       - 2.4.6.3 Soil Texture....26
       - 2.4.6.4 Soil Chemistry....26
       - 2.4.6.5 Adjacent Native Vegetation....26
       - 2.4.6.6 Germination and Survivorship....27
       - 2.4.6.7 Harvesting and Biomass Determination....28
       - 2.4.6.8 Tillers (1989)....28
       - 2.4.6.9 Inflorescences (1990)....28
     - 2.4.7 Statistical Analysis....28

2.5 Results....29
  2.5.1 Climate: Precipitation and Temperature....29
  2.5.2 Soils....33
    2.5.2.1 Soil Profile Descriptions....33
    2.5.2.2 Soil Moisture Gradient....33
    2.5.2.3 Soil Texture....37
    2.5.2.4 Soil Chemistry....37
  2.5.3 Adjacent Native Vegetation....37
  2.5.4 Germination....41
    2.5.4.1 1989 Germination....41
    2.5.4.2 1990 Germination....41
    2.5.4.3 Cohort Germination (1989 and 1990)....41
    2.5.4.4 Total Germination (1989 and 1990)....49
  2.5.5 Seedling Survivorship....49
    2.5.5.1 Survivorship of 1989 Germinants....49
    2.5.5.2 Cohort and Comparative Survivorship....55
    2.5.5.3 Survivorship of 1990 Germinants....55
    2.5.5.4 1990 Survival of 1989 Germinants....55
    2.5.5.5 Total Survivorship....66
  2.5.6 Morphometrics....66
    2.5.6.1 1989 Biomass....66
    2.5.6.2 1990 Biomass....66
    2.5.6.3 1989 Tillers....80
    2.5.6.4 1990 Inflorescences....80

2.6 Discussion....80
    2.6.1 The Gradient....80
    2.6.2 Germination....86
    2.6.3 Survivorship....88
    2.6.4 Above-ground Productivity....89
    2.6.5 Integration....91
2.7 Conclusions....93
2.8 Literature Cited....98

3. **COMPETITIVE ABILITY OF FIVE NATIVE NORTHERN MIXED-GRASS PRAIRIE GRASSES AT THREE POSITIONS ON AN EXPERIMENTAL MOISTURE GRADIENT**......103

3.1 Abstract......103

3.2 Introduction......104

3.3 Methods......106

3.3.1 Experimental Design and Treatments......106

3.3.2 Study Species......108

3.3.3 Seed Sources and Storage......109

3.3.4 Seed Preparation and Planting......110

3.3.5 Data Collection......110

3.3.5.1 Gravimetric Soil Moisture Content......110

3.3.5.2 Harvesting and Biomass Determination...111

3.3.6 Data Analysis......111

3.4 Results......112

3.4.1 Soil Moisture Content......112

3.4.2 Moisture Treatment......114

3.4.3 Comparative Yield......114

3.4.4 Competitive Hierarchy......124

3.4.5 Competitive Influence of Native Grasses on *Bromus inermis*......124

3.5 Discussion......129

3.5.1 Soil Moisture......129

3.5.2 Water Stress......129

3.5.3 Competitive Performance and Hierarchy......130

3.5.4 Morphological and Physiological Interpretation of Competitive Outcome......132

3.5.5 Expression of Competitive Ability along a Resource Gradient......134

3.5.6 "Trade-offs" in Competitive Ability along a Resource Gradient......136

3.6 Conclusions......138

3.7 Literature Cited......141

4. **CONCLUSIONS** 147

4.1 Germination and Establishment 147

4.2 Irrigation 151

4.3 Competition 151

4.4 Relevance and Implications for Restoration 154

4.4.1 Germination and Establishment 154

4.4.2 Irrigation 154

4.4.3 Considerations for Planning a Prairie Restoration 155

4.4.4 Restoration Attributes of Research Species 158

4.4.5. Recommended Percentage for Seeding Mixtures of Research Species for Various Environmental Conditions 167

4.5 Literature Cited 169

APPENDIX 1 Soil descriptions of the five sites along the topographic gradient 170

APPENDIX 2 Locations of species subplots within treatment plots and site locations 175

APPENDIX 3 Dates and locations of seed collection for field experiment 177

APPENDIX 4 Daily precipitation and temperature at study area and Last Mountain Lake Climatological Station (HQ) during the field season in 1989 178

APPENDIX 5 Table 1. Monthly means from 14 years of precipitation and temperature data for Last Mountain Lake National Wildlife Area 181

Table 2. Monthly precipitation and mean temperatures during 1989, 1990, and 14 year average at Last Mountain Lake NWA and 39 year normals from Nokomis, SK 181

Table 3. Mean of soil moisture content from surface and deep soil strata exposed to given pressure potentials 182

Table 4. Mean of the moisture content of soil cores .. 183

Table 5. Proportional composition of surface soil texture 183

Table 6. Soil chemical properties of surface soil samples....................................184

Table 7. Mean of total germination during 1989.......185

Table 8. Mean of total germination during 1990.......185

Table 9. Mean of the number of new germinants at each cohort count date............................186

Table 10. Mean of total germination during 1989 and 1990...190

Table 11. Mean of total survivorship at the end of the 1989 field season...........................191

Table 12. Mean of the number of germinants in select cohorts surviving at each subsequent count date in 1989 and 1990................................192

Table 13. Mean of total 1990 survivorship...........195

Table 14. Mean of total survivorship of 1989 survivors at end of 1990 field season................196

Table 15. Mean of total survivorship at end of second field season..................................197

Table 16. Mean of total survivors at end of second field season.......................................198

Table 17. Least-squares mean of individual above-ground biomass at end of first growing season (1989)...199

Table 18. Least-squares mean of individual above-ground biomass at end of second growing season (1990)...200

Table 19. Least-squares mean of the number of tillers per individual at end of first growing season...201

Table 20. Least-squares mean of flowering culms per individual at end of second growing season........202

APPENDIX 6 Table 1.1. *Agropyron dasystachyum* individual data from field experiment including germination and survivorship in 1989 and 1990....................203

Table 1.2. *Agropyron trachycaulum* individual data from field experiment including germination and survivorship in 1989 and 1990....................221

Table 1.3. *Bromus inermis* individual data from field experiment including germination and survivorship in 1989 and 1990....................238

Table 1.4. *Festuca hallii* individual data from field experiment including germination and survivorship in 1989 and 1990....................250

Table 1.5. *Stipa comata* individual data from field experiment including germination and survivorship in 1989 and 1990....................267

Table 1.6. *Stipa curtiseta* individual data from field experiment including germination and survivorship in 1989 and 1990....................286

Table 1.7. *Stipa viridula* individual data from field experiment including germination and survivorship in 1989 and 1990....................305

Table 1.8. *Stipa viridula* (Lodorm) individual data from field experiment including germination and survivorship in 1989 and 1990....................324

Table 2. Individual data from field experiment including biomass, tiller, and flowering culm data from 1989...341

Table 3. Individual data from field experiment including biomass and flowering culm data from 1990...371

Table 4. Soil texture data from individual samples...399

Table 5. Soil chemistry data from individual samples.400

Table 6. Soil moisture content from individual soil cores...401

Table 7. Pressure plate analysis data from individual samples.................................407

APPENDIX 7 Dates and locations of seed collection for competition experiment....414

APPENDIX 8 Table 1. Individual means of native grass above-ground biomass competing in monoculture or in mixture with *Bromus inermis* at three moisture levels....415

Table 2. Means of biomass production of native grasses competing intraspecifically under two levels of moisture stress....415

Table 3. Means of biomass production of native grasses competing with *Bromus inermis* at three moisture levels....416

Table 4. Means of individual above-ground biomass of *Bromus inermis* competing in monoculture or in mixture with each native grass species at three moisture levels....416

Table 5. Biomass production of *Bromus inermis* competing with native grass species at three moisture levels....417

APPENDIX 9 Table 1. Individual data from competition experiment including intraspecific and interspecific data for native grasses and intraspecific data for *Bromus inermis*....418

Table 2. Individual data from competition experiment including interspecific data for *Bromus inermis*.......429

NOTE: If Appendices are not attached, they are available from the Dept. of Botany (Biological Sciences), University of Alberta; the University of Alberta Science Library; the National Library of Canada; and University Microfilms Inc., Ann Arbor, Michigan.

LIST OF TABLES

TABLE PAGE

II-1. Common native grasses and forbs at Last Mountain Lake National Wildlife Area....16

II-2. Frequency of species presence in the native prairie community adjacent to the experimental study area....17

II-3. Summary of MANOVA results for soil chemistry....39

II-4. Summary of ANOVA results for seed germination in 1989....44

II-5. Summary of ANOVA results for seed germination in 1990....46

II-6. Summary of ANCOVA results for total survivorship at the end of 1989....54

II-7. Summary of ANCOVA results for comparative survivorship at the end of 1990....58

II-8. Summary of ANCOVA results for comparative survivorship of *Stipa* sp. at the end of 1990....59

II-9. Summary of ANCOVA results for comparative survivorship at the end of 1990. Least-squares means comparisons between moisture treatments....60

II-10. Summary of ANCOVA results for the survivorship of the 1990 germinants....62

II-11. Summary of ANCOVA results for 1990 survivorship of individuals surviving at the end of 1989....65

II-12. Summary of ANCOVA results for total survivorship over the two year period....69

II-13. Summary of ANCOVA results for above-ground biomass production in 1989....74

II-14. Summary of ANCOVA results for above-ground biomass production in 1990....75

II-15. Summary of ANCOVA results for tiller production in 1989....83

II-16. Summary of ANCOVA results for flowering culm production in 1990....85

TABLE **PAGE**

III-1. Soil moisture content of a subsample of pots.............113

III-2. Summary of ANOVA results for above-ground biomass.........115

III-3. Yield Suppression Ratio for performance of native grasses competing with *Bromus inermis*.....................122

III-4. Index of Relative Competition Intensity...................123

LIST OF FIGURES

FIGURE PAGE

II-1. Map location of field study area............................14

II-2. Partial climate diagram for Last Mountain Lake National Wildlife Area....................................20

II-3. Experimental design of sites along catena..................22

II-4. Monthly precipitation and mean temperatures in 1989 and 1990 compared to 14 year average at LML NWA.............30

II-5. Monthly means of precipitation and mean daily temperature normals for LML NWA and Nokomis, SK.............31

II-6. Daily maximum and minimum temperatures and precipitation levels at study area.........................32

II-7. Soil profiles at sites along catena........................34

II-8. Mean of soil moisture content from surface and deeper soil strata exposed to given pressure potentials...35

II-9. Mean of soil core moisture content.........................36

II-10. Composition of surface soil texture........................38

II-11. Soil chemical properties of surface soil samples...........40

II-12. Mean of total germination during 1989 field season..........42

II-13. Mean of total germination during 1990 field season..........45

II-14. Mean of the number of new germinants at each cohort count date..47

II-15. Mean of total germination during two year period...........50

II-16. Mean of total survivorship at the end of 1989 field season..52

II-17. Mean of germination cohort survivorship in 1989/90..........56

II-18. Mean of total 1990 survivorship at end of 1990 field season..61

LIST OF FIGURES

FIGURE PAGE

II-19. Mean of total survivorship of 1989 survivors at the end of the 1990 field season....63

II-20. Mean of total survivorship at the end of the second field season....67

II-21. Mean of the total number of individuals surviving at the end of the second field season....70

II-22. Least-squares mean of individual above-ground biomass at the end of the first growing season....72

II-23. Least-squares mean of individual above-ground biomass at the end of the second growing season....76

II-24. Least-squares mean of the number of tillers per individual at the end of the first growing season....81

II-25. Least-squares mean of flowering culms produced per individual at the end of the second growing season....84

III-1. Planting design and locations for experimental pots....107

III-2. Mean of individual above-ground biomass competing in monoculture or in mixture with *Bromus inermis*....116

III-3. Biomass production of grasses competing intraspecifically under two levels of moisture stress....117

III-4. Biomass production of native grasses competing with *Bromus inermis*....118

III-5. Biomass production of native grasses competing with *Bromus inermis*....125

III-6. Biomass production of *Bromus inermis* competing with native grasses....126

III-7. Biomass production of *Bromus inermis* competing with native grasses....127

LIST OF FIGURES

FIGURE PAGE

III-8. Biomass production of native grasses competing intraspecifically in dry moisture regime compared with their biomass production competing interspecifically with *Bromus inermis* in wet regime.......128

III-9. Mean of individual above-ground biomass of *Bromus inermis* competing in monoculture or in mixture with each native grass species at three moisture levels..135

IV-1. Mean of total germination during the two year period.......148

IV-2. Mean of total survivorship at the end of second field season..149

IV-3. Least-squares mean of individual above-ground biomass at the end of the second growing season...................150

IV-4. Biomass production and hierarchies of native grasses competing with *Bromus inermis*.............................152

LIST OF PLATES

PLATES PAGE

II-1. Second year growth of *Agropyron dasystachyum*, *A. trachycaulum*, and *Festuca hallii* on the experimental catena.....78

II-2. Second year growth of *Stipa comata*, *S. curtiseta*, and *S. viridula* on the experimental catena.....79

III-1. Growth of *Agropyron trachycaulum* after 16 weeks competing intraspecifically and interspecifically with *Bromus inermis* from dry and wet moisture regimes.....119

III-2. Growth of *Stipa curtiseta* after 16 weeks competing intraspecifically and interspecifically with *Bromus inermis* from dry and wet moisture regimes.....120

III-3. Growth of *Stipa viridula* after 16 weeks competing intraspecifically and interspecifically with *Bromus inermis* from dry and wet moisture regimes.....121

I. Introduction

Native grassland vegetation has been almost entirely eliminated from the Canadian prairies since European settlement (Trottier, 1992). The rich soil-building characteristics of the prairie vegetation and the flat topography made the northern mixed-grass prairie and aspen parkland suitable for cultivative agriculture (Gayton, 1990). Today, the native prairie vegetation largely survives as small and isolated fragments of what was once a large and contiguous ecosystem with immense complexity and diversity (Gauthier and Henry, 1989).

The large-scale conversion of prairie habitat resulted in fragmentation, isolation of prairie remnants, and created problems for the survival of the native prairie ecosystem (World Wildlife Fund, 1989). Fragmentation has left small islands of native prairie surrounded by a vast sea of non-native agronomic (i.e. exotic) vegetation. This process has created a tenuous future for the prairie remnants by genetically isolating much of the flora and fauna and by creating a large edge-to-area effect (*sensu* island biogeography), exposing the community to significant exotic invasion. Examples from island biogeography confirm that the smaller the habitat 'island', the fewer species the community is able to support (MacArthur and Wilson, 1967). Fragmentation could alter population dynamics and species interactions within the prairie remnants. Increased edge-effect has been found to alter insect predator-prey relationships and population dynamics in fragmented forest communities (Roland, 1993). Habitat isolation would undoubtedly limit the exchange of genetic material between communities, thus reducing the fitness and viability of individuals and species in these prairie remnants (Briggs and Walters, 1986). Exotic invasion, particularly with the exclusion of fire and grazing, has resulted in the total or virtual elimination of native vegetation as the wave of exotic plants, predominantly European grasses, spreads through its communities (pers. obs.). Without intervention, the only prairie communities that will remain in the future are those large enough or managed to withstand the isolation and invasion, or those communities adapted for the extremes in moisture and/or salinity. The only hope for the majority of communities remaining is intensive long-term management, or enlarging and connecting remnants through restoration coupled with appropriate management.

Prairie restoration ("recreation") involves actively planting a complex mixture of native species resembling the native vegetation assemblage that would have existed in the area before cultivation. On a landscape scale the environment is a mosaic of differences in elevation, soil types and nutrient status, moisture availability, temperature, etc.. When considering large-scale community restoration, the two major questions are: (1)'Will these landscape-controlled environmental differences influence the vegetation community that establishes?'; and (2)'Should the species selected for planting be modified to take these differences into account?'.

Species composition shifts in prairie vegetation communities have been associated with differences in the environmental mosaic. This vegetation patterning has been observed with changes in topography (Ayyad and Dix, 1964; Dix, 1968; Crist and Glenn-Lewin, 1978; Barnes et al., 1983; Coxson and Looney, 1986; Fowler and Dunlap, 1986; Gurevitch, 1986a; Lieffers and Larkin-Lieffers, 1987) and soil type (Bliss and Cox, 1964; Dix and Smeins, 1967; Baines, 1973; Redmann, 1975; Barnes and Harrison, 1982; Nelson and Anderson, 1983; Werger et al., 1983; Archer, 1984; Barnes et al., 1984; White and Glenn-Lewin, 1984; Barnes, 1985; Butler and Goetz, 1986; Shumar and Anderson, 1986; Diamond and Smeins, 1988). These differences were correlated largely with soil moisture availability.

The correlation of species distribution with environmental factors may relate more to a species "ecological tolerance limits" in a diverse long-established native ecosystem than to its "physiological tolerance limits" (Barbour, Burk, and Pitts, 1987). The latter often indicate a much greater range of possible growth and distribution along environmental gradients. Although a species physiological optimum (tolerance limits) allows germination and initial establishment over a greater range of environmental conditions (Potvin, 1984), species interactions, such as competition, are known to restrict the distribution of a species along environmental gradients to a much narrower distributional range, (i.e. within a species ecological optimum (tolerance limits)) (Bannister, 1964). A species physiological optimum along an environmental gradient is important to consider when planning a prairie restoration with limited species and seed availability and when predicting vegetation establishment patterns and community development.

Competition, which is a major factor determining ecological tolerance limits, affects the species composition of vegetation and is influential in community development and vegetation patterning along resource gradients (Grime, 1973; Potvin, 1984; Gurevitch, 1986b; Wilson and Keddy, 1986; Tilman and Wedin, 1991; Wilson and Tilman, 1991). Knowledge of the intensity of competition among restoration species along the environmental gradients would provide insight into how the selected species would perform together throughout the community and any species growth restrictions brought about by competition.

The restoration of a prairie landscape would benefit greatly from knowledge of: (1) the existing environmental factors; (2) how they vary along gradients; (3) what plant species are suitable for these environments, and (4) how these species interact. Moreover, the number and type of species used in a prairie restoration will greatly influence the initial and subsequent vegetation communities that develop. The distribution and abundance of species in a restored or revegetated community may not resemble those found in a complex native community on the same site.

1.1. THE STUDY SYSTEM

The study area is located in Last Mountain Lake National Wildlife Area (LML NWA) in south-central Saskatchewan, Canada (51° 22'N, 105° 12'W). LML NWA is within the northern mixed-grass prairie ecoregion (Ga) at the ecotone of the aspen parkland (Gt) (Ecoregions Working Group, 1989). The NWA is ca. 15,000 hectares in size and surrounds the northern end of Last Mountain Lake. The area has a flat to undulating topography with the greatest topographic relief along the lake's east side. It is composed of between 25-50% native vegetation and has a patchwork mosaic of native prairie, planted exotic, and mixed native and exotic species communities. The majority of the native prairie remaining in the NWA is on the north and east side of the lake. 318 plant species (number constantly increasing) (Caldwell et al., 1987) and 258 bird species (Dale, 1987) have been identified on the NWA. The NWA is strategic not only for native prairie habitat and species conservation, but also for endangered bird species and migratory waterfowl.

The Canadian Wildlife Service, which administers National Wildlife Areas, desires to reduce native prairie fragmentation and exotic invasion within LML NWA. This would be achieved by connecting fragments through active restoration of intervening land and creating native vegetation buffer zones. The goal is to establish larger contiguous native grassland cores to facilitate long-term sustainable management.

1.2. THE EXPERIMENTAL RESEARCH

To undertake cost-effective and ecologically sound restoration of northern mixed-grass prairie on the undulating landscape within the Last Mountain Lake National Wildlife Area, it was deemed necessary to understand (1) the germination and establishment capabilities of each major grass species along a topographic gradient, and (2) how these species may interact along that gradient.

The native grass species used were *Agropyron dasystachyum* (Hook.) Scribn. (northern wheatgrass), *Agropyron trachycaulum* (Link) Malte (slender wheatgrass), *Festuca hallii* (Vasey) Piper (plains rough fescue), *Stipa comata* Trin. & Rupr. (needle and thread grass), *Stipa curtiseta* (A.S. Hitchc.) Barkworth (porcupine grass), and *Stipa viridula* Trin. (green needle grass). Species nomenclature follows Moss (1983). *Bromus inermis* Leyss. (smooth brome), a problem invasive exotic species, was used for comparison. The six native grasses are all cool-season (C3) species; all can be dominant in different areas within an undulating landscape. In combination, the distribution of these species spans the entire topographic gradient and associated gradient of moisture availability.

The field experiment (Chapter 2) examined the effects of location, soil properties, and moisture availability along a topographic catena in the LML NWA on the success of seed germination (*sensu* emergence), seedling establishment, survivorship, shoot production, and flowering of the six grasses. At five sites along the catena, plots were planted to monocultures of each grass species to determine the effects of topographic site on the five listed properties. The question being addressed was, "How does variation in soil environment affect the appropriate selection of species and seed mixtures to be used for restoration within an undulating landscape?". An irrigation treatment was used to study the influence of moisture availability and to provide predictions for results within a higher moisture regime.

The objectives of the laboratory competition experiment (Chapter 3) were (1) to assess the relative competitive abilities of the six native species (*Festuca hallii* was excluded due to extremely slow growth) along a moisture gradient, and (2) to study the order of competitive ability among the native grasses and determine if the species rank order changed along the moisture gradient. The question addressed by this experiment was, "How do species interact with each other in different soil moisture environments?". For this purpose *Bromus inermis*, the exotic grass, was used as a "phytometer" (*sensu* Gaudet and Keddy, 1988). A growth experiment with seedlings established in large pots was conducted at three levels of soil moisture availability in a growth room environment. The outcome would provide evidence on whether biotic or abiotic stress is more important in shaping species distribution and abundance patterns along resource gradients. It would also provide evidence on whether the competitive hierarchy among species is influenced by resource levels along a gradient and whether reversals in species competitive abilities predict species distribution patterns in the vegetation of an undulating landscape. The competitive ability of each native species with *Bromus inermis* also would be determined.

The Conclusions (Chapter 4) will examine the implications of the experiments and provide insight into the relevance and importance of the results for prairie restoration and management.

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II. The Germination, Survivorship, and Productivity of Six Native Northern Mixed-Grass Prairie Grasses along a Topographic Gradient.

2.1. ABSTRACT

In the mixed-grass prairie, species compositional patterns in grassland vegetation have been associated with topography. This patterning is highly correlated with soil moisture availability. To examine how topographic gradients influence the re-establishment of prairie grasses, a split split randomized block design was used at five topographic sites along a catena. Seeds of six native, one native cultivar, and one exotic grass species were planted in a systematic monoculture design and monitored for two growing seasons (only first season for exotic). Germination (*sensu* emergence) was recorded, germinants marked, and subsequent survivorship monitored. Shoot and potential seed production were quantified by enumeration of individual tillers and flowering culms in the first and second years, respectively. Above-ground, oven-dry biomass of individuals was assessed at the end of both growing seasons. The experiment was performed under two moisture treatments: precipitation supplemented by weekly watering and control (natural precipitation).

Variations in moisture availability, resulting from differences in soil properties and topography, were mainly responsible for the non-uniform germination, survivorship, and productivity of the grasses planted along the catena. A greater proportion of seeds germinated of the more mesophytic grasses (*Agropyron dasystachyum, A. trachycaulum, Bromus inermis*, and *Festuca hallii)* compared to the xerophytic grasses (*Stipa comata, S. curtiseta, S. viridula*, and *S. viridula* (Lodorm)). The mesophytic grasses and *S. viridula* (Lodorm) all germinated in the first spring. In the remaining xerophytic species, germination recorded over the two year period varied in amounts from mainly in the first year in *S. curtiseta* (85%) to virtually all in the second year in *S. viridula* (90%).

Survivorship and productivity were generally lower in drier sites. Survivorship in the xerophytic species was less affected by variation in moisture availability and they generally produced slightly greater above-ground biomass on the upper portion of the hillside. Productivity was markedly reduced in the alkaline lowland, except in A. *trachycaulum*.

Irrigation hastened germination and had a slightly positive influence on germination and survivorship, particularly in the more mesophytic species and when a period of drought immediately followed germination. Irrigation during the first growing season also affected dormant seeds, reducing germination of the *Stipa* spp. in the second year, and second-year productivity, reducing above-ground growth and flowering culm production in *A. dasystachyum* and *A. trachycaulum*.

From the experimental results, seeding rates for planting mixtures are recommended for the topographic catena investigated.

2.2. INTRODUCTION

In the native mixed-grass prairie region, gradual changes in species composition have been found in the plant communities which span the topographic undulations from the upland ridges to the lowland depressions (Coupland, 1950). This patterning of grassland vegetation associated with topography has been described by changes either in the vegetation associations or in the distribution of species found, both from intact prairie soil catenas (Ayyad and Dix, 1964; Dix, 1958; Crist and Glenn-Lewin, 1978; Coxson and Looney, 1986; Gurevitch, 1986) and from assemblages of disjunct communities (i.e. stands not located along the same slope) (Barnes et al., 1983; Fowler and Dunlap, 1986; Lieffers and Larkin-Lieffers, 1987). This patterning has been correlated largely with soil moisture availability. Along a prairie slope, there also is a catena of soil types associated with topographic position (Acton, 1965). This gradient in soil texture and structure may be the factor mediating moisture availability which is responsible for observed changes in the species distribution and the vegetation associations. These changes have been observed along intact prairie catenas by numerous workers (Baines, 1973; Barnes and Harrison, 1982; Nelson and Anderson, 1983; Werger et al., 1983; Barnes et al., 1984; Barnes, 1985; Butler and Goetz, 1986; Shumar and Anderson, 1986). Variations in species distribution associated with changes in soil type and topography have also been recorded from assemblages of disjunct communities (Bliss and Cox, 1964; Dix and Smeins, 1967; Redmann, 1975; Archer, 1984; White and Glenn-Lewin, 1984; Diamond and Smeins, 1988).

Although the patterning of established vegetation associated with topographic gradients is correlated with soil moisture availability, the factors which influence the recruitment of individuals into the community, expressed as the "regeneration niche", may play a more critical role in explaining the abundance and distribution of species along a gradient (Harper and White, 1974; Grubb, 1977). The reason is that environmental conditions which established plants most often experience may be unsuitable for seed germination and seedling survivorship (Harper, 1977; Grime, 1979). Therefore, any "correlations between the distribution of mature plants and existing environmental factors may be spurious, since the crucial factors determining the present position of individuals were those operating in seedling stages" (Sagar and Harper, 1961). Species abundance in a community may be controlled by the number of species-specific "safe sites" (i.e. microsites that provide the necessary conditions and resources while excluding the hazards which would be detrimental) that are available for germination and seedling survivorship. A species may be absent from a community or portion of a community because either there are no safe sites available for that species even though seed is present, or there is no seed present regardless of the availability of safe sites (Harper, 1977).

The disparity between the requirements for immature (seed, seedling, and juvenile) and for mature individuals should indicate the influence that the early development stages might have on the patterning of established vegetation along environmental gradients. If the success rate of a species along the gradient is low during the regeneration stages because of its inherent morphological and physiological characteristics, then this species could be excluded from some sections of the gradient due to the absence of safe sites for germination and seedling establishment. The pattern of seedling establishment could then be directly responsible for the distribution pattern of the mature individuals of the plant community which develops. Alternatively, the seedling establishment pattern along the gradient may not determine the ultimate species distribution pattern because of post-establishment stresses (e.g. survivorship and competition) which would be more important in shaping the vegetation community (Potvin, 1984).

The germination of seeds (Bokhari et al., 1975) and the survival of seedlings (Fowler, 1986) are strongly influenced by abiotic factors such as soil temperature, water stress, and light. The biochemical activity of seed germination is suppressed if the water potential of the environment surrounding the seed falls below the optimum moisture content of the seed maintained, initially during the imbibition stage, by matric potential mainly, and later increasingly with the additional osmotic forces due to the solubilization of reserves (McDonough, 1975). Insufficient soil moisture, brought about by lack of precipitation, excessive soil drying through evaporation, or competition with established vegetation, has a detrimental effect on germination and seedling recruitment (Fowler, 1986). Germinating seeds of *Stipa viridula*, for example, are sensitive to temporary dehydration and young seedlings succumb to drought conditions because of poor development of seminal lateral roots when the seminal primary root is injured by drought stress (Fulbright et al., 1984). This sensitivity to drought stress may be the reason that this species is distributed predominantly on mesic sites. The germination of *Festuca hallii* is significantly affected by changes in both temperature and water potential, although the suppression of seed germination by transient or low moisture availability overrides the effects of temperature (Romo et al., 1991). Although successful germination and establishment are reduced by insufficient moisture, an intermediate amount of precipitation which promotes germination but is insufficient for successful establishment is more harmful than low precipitation levels which permit the seeds to remain dormant (Frasier et al., 1987).

Constraints to germination and seedling establishment have been linked to soil texture (Bannister, 1964; de Alba-Avila and Cox, 1988) which would ultimately mediate the available moisture. The effect that declining water potential has on germination and establishment can be induced by decreasing the soil matric potential through increased water stress and/or decreasing the soil osmotic potential through increased salt stress. Both of these constraints will not only reduce the rate of, but will delay these seed development processes, thus necessitating a longer period of adequate soil moisture for successful germination and seedling establishment (Mueller and Bowman, 1989).

Declining soil moisture appears to be the underlying reason for seedling mortality. However, the heterogeneity at the scale of a seed (Harper, 1977) and the difficulty of measuring the microenvironment that a seed or seedling perceives has prevented the understanding of why one individual dies while another survives (Cook, 1979). A young germinant "is the most susceptible phase in the ontogeny of the individual" (Cook, 1979). As seedlings develop, the risk of stress-induced mortality greatly declines (Summerfield, 1973). Clearly the stage of development or plant size when an individual is exposed to an environmental stress is an important factor influencing survivorship (Cook, 1979). Conditions favourable for germination and seedling establishment may occur infrequently, exist for short periods of time, or be confined to small microsites (Putwain and Harper, 1970). The location of successful seed germination and recruitment of individuals therefore may be sporadic and differ among species.

A direct link between ecophysiology, resource reduction, and species distribution patterns along a gradient is suggested by Tilman and Wedin (1991) from the examination of vegetative growth rates, nitrogen-use efficiency, and root and reproductive allocation of a number of grass species. The differences in rooting morphology, photosynthetic physiology, and drought tolerance mechanisms, which all imply dissimilarities in the utilization of the water resource, were also found to be causal factors influencing species distribution patterns associated with moisture availability along a topographic gradient (Barnes and Harrison, 1982). Barnes (1985) suggested that dissimilarities in water-use efficiency between *Andropogon gerardi* and *A. hallii*, resulting from differences in morphological and physiological drought resistance characteristics, are responsible for the segregation of these two prairie grasses along a topographic moisture gradient. Such morphological and physiological dissimilarities also are correlated with the segregation of prairie species with different photosynthetic pathways (C_3 *versus* C_4) along topographic moisture gradients (Barnes and Harrison, 1982; Barnes et al., 1983; Archer, 1984; Barnes et al., 1984; Coxson and Looney, 1986; Gurevitch, 1986). This segregation may thus be a differential response of these species to changing soil textures and their inherent moisture holding capacities (Redmann, 1975). Such plant characteristics also were found to be responsible for the segregation of solely warm-season (C_4) grasses along a topographic moisture gradient (Knapp, 1984).

The distribution of a species within a vegetation community may not be defined solely by the abiotic constraints of its tolerance limits but also by the biotic constraints imposed upon it by other, associated species. Differences in morphology and physiology of seedlings, whether within or among species, are known to be crucial to the establishment success of individual plants in different habitats (Stebbins, 1974). Although germination rate may increase with higher moisture availability, the location of seedling establishment can be influenced by the tolerance limits of the species or ecotype. These evolved constraints should result in higher survivorship within certain sections of the moisture gradient (Bannister, 1964). Thus a species growing alone in monoculture may inhabit a greater range (wider ecological amplitude) of an environmental gradient even though the performance of that species may not be equivalent over the entire range of the gradient that it occupies. A species may adapt to factors responsible for seedling mortality either (1) by minimizing the amount of time spent in the juvenile stage through a high intrinsic growth rate, which coupled with a high respiration rate may be detrimental in low-resource habitats, or (2) by developing morphological or physiological adaptations that increase the resistance to stress, thus lowering the probability of death over a prolonged juvenile period (Grime and Hunt, 1975). Species diversity in a plant community is facilitated by individual selection through mortality which occurs in the time between seed dispersal and reproduction. Selective mortality may produce rapid differentiation of local plant populations and permit a species to maintain a wider ecological amplitude as a whole and to inhabit various environments within a community. This species-specific adaptation to particular "safe-sites" may allow independent regulation of populations and also permit coexistence (Cook, 1979).

There is a paucity of research addressing the questions of how the pattern of prairie grass seedling establishment is influenced by topographic gradients and how it correlates with the distribution of mature individuals. After sowing seeds of native grass species along a topographic gradient, Potvin (1984) found that successful germination and seedling establishment were aided by increased soil moisture. She observed that the location with the highest soil moisture regime was dependent on whether the site had established vegetation or not and on differences in soil texture. Along a slope where two prairie grasses were segregated in the established vegetation community, mainly to opposing ends of the gradient, the greatest recruitment for both species from artificial seeding was in the lower slope section associated with greater moisture availability. She suggested that the "patterns of seedling survivorship alone cannot explain the distribution patterns of adult plants".

The primary objective of this study was to examine the effects of location, soil properties, and moisture availability along a topographic catena on seed germination (*sensu* emergence), seedling establishment, survival, shoot production, and flowering of six native, cool-season (C_3) prairie grasses. This information, not currently available, would provide empirical evidence on the most appropriate sites for the use of these species when planning revegetation of an undulating prairie landscape.

2.3. STUDY AREA

2.3.1. Location

The project was performed at Last Mountain Lake National Wildlife Area (LML NWA) in south-central Saskatchewan, Canada (51° 22'N, 105° 12'W; south SW32 T27 R23 W2) (Fig. II-1) during 1988 to 1990. The NWA, administered by the Canadian Wildlife Service (Environment Canada), surrounds the northern end of Last Mountain Lake and has flat to undulating topography. The study area encompasses a topographic relief of 9.5 m.

2.3.2. Geology

The bedrock of the Canadian Interior Plains is largely of Cretaceous age and consists of shale, siltstone, and sandstone (Klassen, 1989). The landscape features and geologic formations of the area were created largely during the Quaternary period with the Wisconsinan deglaciation. The surficial material is composed mainly of till, but includes lacustrine silt and clay and fluvial sands and gravels (Greer and Christiansen, 1963). Last Mountain Lake was created by the Watrous-Last Mountain Lake meltwater spillway draining Lake Saskatchewan and Glacial Last Mountain Lake into the Qu'Appelle River between 12 500 and 12 000 years B.P. (Christiansen, 1979). The depression that holds Last Mountain Lake may be a remnant of the preglacial Regina Valley or a remnant of a tributary to the pre-Condiean Qu'Appelle Valley (Greer and Christiansen, 1963). The Last Mountain Lake Lowland has a high salt content from groundwater discharge drawn from the Allan and Touchwood Hills (Greer and Christiansen, 1963).

2.3.3. Soil

Soils in the vicinity of the study area have been classified as Elstow and Weyburn Loam (Sask. Soil Survey, 1991) with findings suggesting the same for the study area itself (Sask. Soil Survey, 1992). The upper slopes tend to be Weyburn associations of Orthic or Calcareous Dark Brown Chernozems on loamy glacial till; the lower to mid-slopes are mainly Elstow associations of Orthic Dark Brown Chernozems on silty lacustrine material; and the lowlands are poorly-drained meadow associations or gleysolic Elstow associations (Sask. Soil Survey, 1992). The soil texture of the area is light, varying from loam to light loam, fine sandy loam, and sandy loam, including extensive alkaline areas (Stephen, 1967). The study area is associated with a topographic catena and thus has a sequence of soil types from the ridgetop to the lowland. The soils have been identified as Chernozems grading from Orthic Dark Brown in the upperslope into Orthic Black that covers the middle and lower slope sections and Gleyed Dark Brown in the lowland due to a shallow fluctuating water table (Appendix 1). It has been suggested that all the soils should fall into the Dark Brown Great Group (R. Stushnoff, Sask. Soil Survey, pers. comm.).

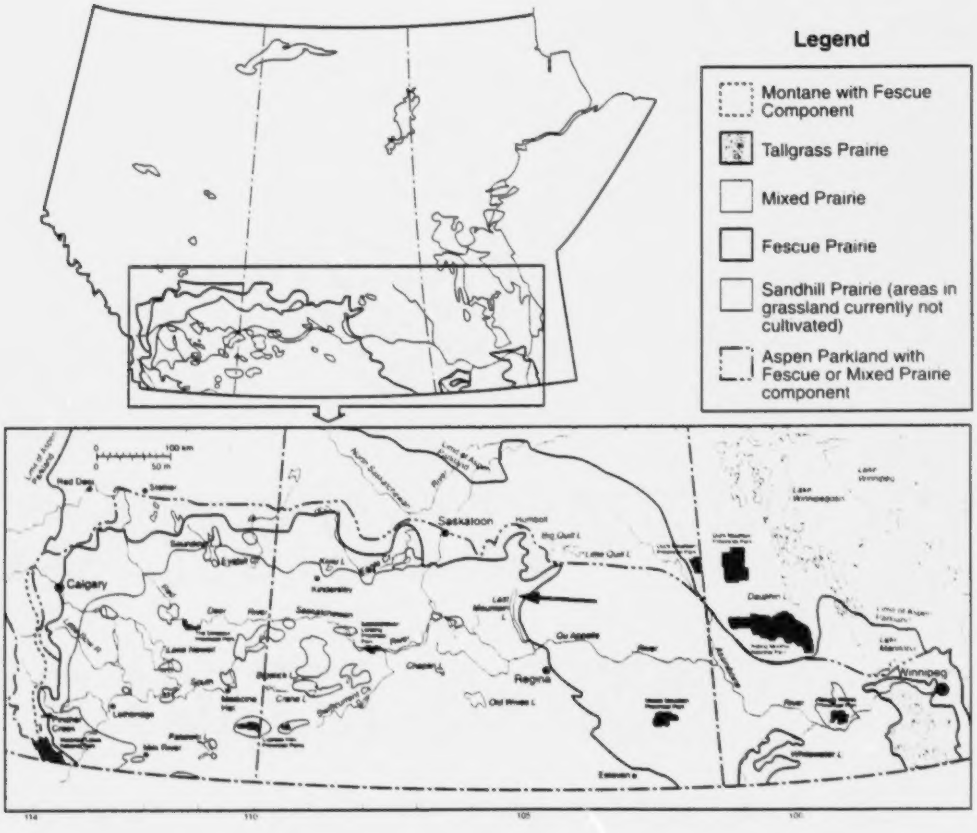

Legend
Montane with Fescue Component
Tallgrass Prairie
Mixed Prairie
Fescue Prairie
Sandhill Prairie (areas in grassland currently not cultivated)
Aspen Parkland with Fescue or Mixed Prairie component
100 km
50 m
Red Deer
Calgary
Saskatoon
Humboldt
North Saskatchewan River
Last Mountain L.
Qu'Appelle River
Regina
Old Wives L.
Chaplin L.
Estevan
Lake Winnipeg
Lake Winnipegosis
Dauphin L.
Lake Manitoba
Winnipeg
Limit of Aspen Parkland
114
110
105
100

Fig. II-1. Study area was located at the north end of Last Mountain Lake in south-central Saskatchewan, Canada (51° 22'N, 105° 12'W). It was at the ecotone of the mixed-grass prairie and aspen parkland ecoregions. Map from Trottier, 1992.

2.3.4. Vegetation

The study area is located within the *Stipa-Agropyron* Faciation of the Mixed-grass Prairie Association (Coupland, 1961) at the ecotone of the Aspen Parkland ecoregion in the northern Great Plains. The area is dominated by cool-season (C_3) grasses and forbs (Table II-1). Many communities have become dominated by invasive exotics, such as *Bromus inermis* Leyss., *Poa pratensis* L., and *Agropyron repens* (L.) Beauv. (Nernberg, 1987). Scattered clumps of *Populus tremuloides* Michx. and *Salix* sp. occupy wet depressional areas while moist areas have some component of shrubby vegetation predominately of *Symphoricarpos occidentalis* Hook., *Rosa woodsii* Lindl., and/or *Elaeagnus commutata* Bernh. *ex* Rydb. (Stephen, 1967). Areas of poor drainage tend to be alkaline and support salt-tolerant grasses and forbs, such as *Agropyron trachycaulum, Distichlis stricta* (Torr.) Rydb., *Hordeum jubatum* L., *Muhlenbergia richardsonis* (Trin.) Rydb., *Poa juncifolia* Scribn., *Puccinellia nuttalliana* (Schult.) A.S. Hitchc., *Orthocarpus luteus* Nutt., and *Linum lewisii* (Nernberg, 1987). A species list for the native community adjacent to the study area is found in Table II-2.

2.3.5. Site History

The land encompassing the study area was broken around 1905 to 1910, except for the lowland site which had never been previously broken. The cultivated area was kept under cereal crop production until 1968 when it was purchased by the Canadian Wildlife Service and seeded to tame hay composed of alfalfa (*Medicago sativa* L.), crested wheatgrass (*Agropyron pectiniforme* R. & S.), and smooth brome (*Bromus inermis*). The area has remained in this vegetative cover and forage crops have been mechanically harvested annually to occasionally.

2.3.6. Climate

The region is semi-arid and has a typical continental climate with cold winters, hot summers, and most precipitation falling during the growing season. The mean annual precipitation is 339 mm (14 year average from Last Mountain Lake Climatological Station) with an average of 57% of the precipitation falling during the four month period from May to August. The mean daily temperature of July, the hottest month, is 19 °C, while the mean daily maximum temperature for July is 26 °C. A climate diagram (Walter, 1979) was constructed to portray the climatological averages determined from monthly records (Meteorological Observations in Western Canada - Environment Canada) for Last Mountain Lake National Wildlife Area from the period July 1975 to December 1989 (Fig. II-2).

Table II-1. Common native grasses and forbs at Last Mountain Lake National Wildlife Area (Nernberg, 1987).

Graminoids	Forbs
Agropyron dasystachyum (Hook.) Scribn.	*Achillea millefolium* L.
A. smithii Rydb.	*Allium textile* Nels. & Macbr.
A. trachycaulum (Link) Malte	*Anemone patens* L.
Festuca hallii (Vasey) Piper	*Artemisia frigida* Willd.
Koeleria macrantha (Ledeb.) J.A. Schultes f.	*Aster ericoides* L.
Poa canbyi (Scribn.)	*A. laevis* L.
P. cusickii Vasey	*Astragalus flexuosus* Dougl. *ex* G. Don
Stipa comata Trin. & Rupr.	*A. pectinatus* Dougl. *ex* Hook.
S. curtiseta (A.S. Hitchc.) Barkworth	*Erigeron caespitosus* Nutt.
S. viridula Trin.	*Galium boreale* L.
	Linum lewisii Pursh
	Solidago missouriensis Nutt.
	Thermopsis rhombifolia (Nutt.) Richards.
	Vicia americana Muhl.

Table II-2. Frequency of presence expressed as percent vegetation species composition of the native prairie community adjacent to the experimental study area. Five linear transects (ca. 150 m) perpendicular to the topographic gradient were sampled from the ridgetop (A) to the lowland (E). Presence data collected from 10 cm x 10 cm quadrats and expressed as percentage of total quadrats sampled in each transect.

	Transects (# of quadrats sampled)				
Species	A(260)	B(210)	C(250)	D(230)	E(240)
Graminoids:					
Agropyron smithii Rybd.	66.2	7.1	13.2	5.7	-
Carex filifolia Nutt.	77.3	14.8	93.2	63.0	0.4
Stipa comata **Trin. & Rupr.**	**23.5**	**1.4**	**35.2**	**3.9**	-
Stipa viridula **Trin.**	**8.1**	**11.0**	**2.8**	**14.8**	-
Koeleria macrantha (Ledeb.) J.A. Schultes f.	1.5	-	6.4	6.1	-
Poa pratensis L.	0.4	38.1	-	14.8	-
Bromus inermis **Leyss.**	-	**4.3**	-	**3.9**	-
Stipa curtiseta **(A.S. Hitchc.) Barkworth**	-	-	**16.4**	**22.6**	-
Agropyron dasystachyum **(Hook.) Scribn.**	-	-	**0.8**	**10.0**	-
Bouteloua gracilis (HBK) Lag.	-	-	-	13.0	-
Distichlis stricta (Torr.) Rydb.	88.8	-	-	8.3	17.9
Agropyron trachycaulum **(Link) Malte**	4.6	**8.1**	-	5.7	34.6
Agropyron repens (L.) Beauv.	-	8.1	-	-	20.0
Carex sp.	0	1.0	-	1.3	13.8
Calamagrostis inexpansa A. Gray	-	-	-	-	15.8
Juncus balticus Willd.	-	-	-	-	6.3
Hordeum jubatum L.	-	-	-	-	1.7
Beckmannia syzigachne (Steud.) Fern.	-	-	-	-	0.8

Shrubs:					
Symphoricarpos occidentalis Hook.	28.8	46.2	1.2	20.9	-
Rosa arkansana Porter	1.5	-	-	2.2	-
Rosa woodsii Lindl.	-	8.6	-	-	-
Rosa acicularis Lindl.	-	1.0	-	-	-
Other sp.:					
Artemisia ludoviciana Nutt.	0.4	-	-	-	-
Lygodesmia juncea (Pursh) D. Don	0.8	-	-	-	-
Androsace septentrionalis L.	5.8	2.9	-	-	-
Sphaeralcea coccinea (Pursh) Rydb.	0.4	0.5	-	-	-
Linum lewisii Pursh	-	1.0	-	-	-
Vicia americana Muhl.	8.8	-	0.8	-	-
Tragopogon dubius Scop.	1.2	-	-	-	0.4
Solidago sp. (juvenile)	1.9	3.8	0.4	-	-
Potentilla pensylvanica L.	0.8	-	0.4	-	-
Artemisia frigida Willd.	23.5	8.1	28.0	13.9	-
Astragalus dasyglottis Fisch. ex DC.	0.4	2.9	0.4	0.9	-
Aster sp.	2.7	1.4	-	0.9	-
Selaginella densa Rydb.	24.2	-	48.0	1.7	-
Psoralea argophylla Pursh	0.8	-	0.8	0.4	-
Astragalus flexuosus Dougl. ex G. Don	1.9	1.9	-	1.7	-
Thermopsis rhombifolia (Nutt.) Richards	1.5	0.5	-	6.1	-
Achillea millefolium L.	-	0.5	66.8	47.4	-
Chenopodium sp. (#1)	4.2	4.8	2.8	3.9	8.8
Sisymbrium sp.	-	1.9	-	7.8	4.2

Solidago missouriensis Nutt.	-	-	-	4.3	-
Comandra pallida (DC.) M.E. Jones	-	-	-	2.2	-
Phlox hoodii Richards.	-	-	-	1.7	-
Anemone patens L.	-	-	-	1.7	-
Atriplex nuttallii S. Wats.	-	-	-	0.9	-
Chenopodium leptophyllum (Nutt. ex Moq.) S. Wats	-	-	-	0.4	4.6
Melilotus sp.	-	-	-	-	50.0
Sonchus arvensis L.	-	-	-	-	17.5
Ambrosia artemisiifolia L.	-	-	-	-	16.7
Chenopodium sp (#2)	-	-	-	-	7.5
Solidago canadensis L.	-	-	-	-	0.8
Cirsium arvense (L.) Scop.	-	-	-	-	0.4

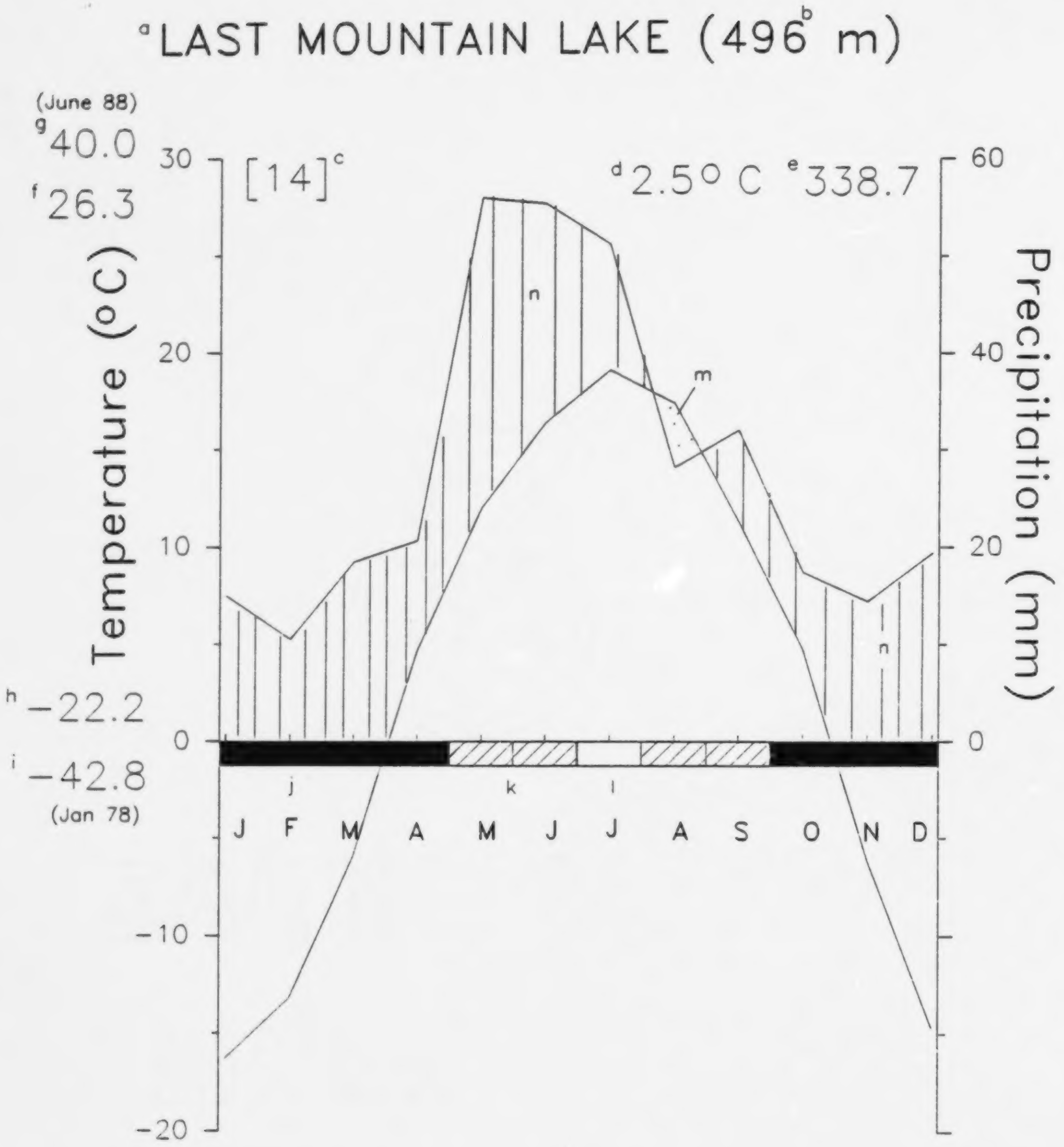


Fig. II−2. Partial climate diagram (after Walter, 1979) for Last Mountain Lake National Wildlife Area, Saskatchewan for the years 1978−1991. a=location, b=elevation, c=years of observation, d=mean annual temperature (°C), e=mean annual precipitation (mm), f=mean daily temperature maximum of warmest month, g=absolute maximum temperature, h=mean daily temperature minimum of coldest month, i=absolute minimum temperature, j=months with mean daily minimum <0 °C, k=months with absolute minimum <0 °C, l=frost free months, m=period of relative drought, n=relative humid season. (Means in Appendix 5 − Table 1).

2.4. METHODS

2.4.1. Experimental Design and Treatments

A split split randomized block design was employed at five topographic sites established along an intact west-facing hillside catena (Fig. II-3). The catena chosen provided the steepest gradient with the least amount of undulation within the LML NWA. The five sites located along the catena were positioned equidistantly in elevation, using a transit, from the top of the ridge to the toe of the slope, which was adjacent to an area of emergent vegetation from the lake. The distance between the sites on the ends of the gradient was 340 m horizontally and 9.53 m vertically. At each site a 12 m by 2 m plot was established and the length was oriented perpendicular to the topographic gradient at 15 degrees west of magnetic north.

Two moisture treatments were established at each site. The control treatment consisted of natural precipitation while the irrigation treatment received supplemented water to an average weekly level equivalent to the summer (May - August) precipitation of a moist prairie region (Edmonton, AB). The maximum weekly irrigation was equivalent to 14.6 mm of precipitation. Irrigation water was supplied manually with a watering can in four separate episodes over three to four hours to avoid soil erosion and uneven distribution of water. The three replicate plots for both moisture treatments were positioned by restricted randomization whereby the moisture treatments were not allowed to be completely segregated. A moisture barrier of four layers of plastic was installed to 60 cm in depth between adjacent treatment plots if they were assigned different moisture treatments.

The length of each treatment plot (160 cm by 120 cm) was oriented parallel to the topographic gradient and contained two species subplots (60 cm by 20 cm) for each of the eight grass species utilized (Fig. II-3). The species subplots were positioned by restricted randomization whereby no more than two species were allowed to have adjacent duplicate subplots in a treatment plot (Appendix 2).

2.4.2. Study Species

The grass species used in the experiment were *Agropyron dasystachyum* (Hook.) Scribn. (northern wheatgrass), *Agropyron trachycaulum* (Link) Malte (slender wheatgrass), *Festuca hallii* (Vasey) Piper (plains rough fescue), *Stipa comata* Trin. & Rupr. (needle and thread grass), *Stipa curtiseta* (A.S. Hitchc.) Barkworth (porcupine grass), *Stipa viridula* Trin. (green needle grass), *Stipa viridula* (variety Lodorm) and *Bromus inermis* Leyss. (smooth brome). With the exception of *S. viridula* var. Lodorm, these species are common in and only *B. inermis* is not native to the northern regions of the mixed-grass prairie in the North American Great Plains (Looman, 1982). The community distribution of these species spans a wide range of grassland

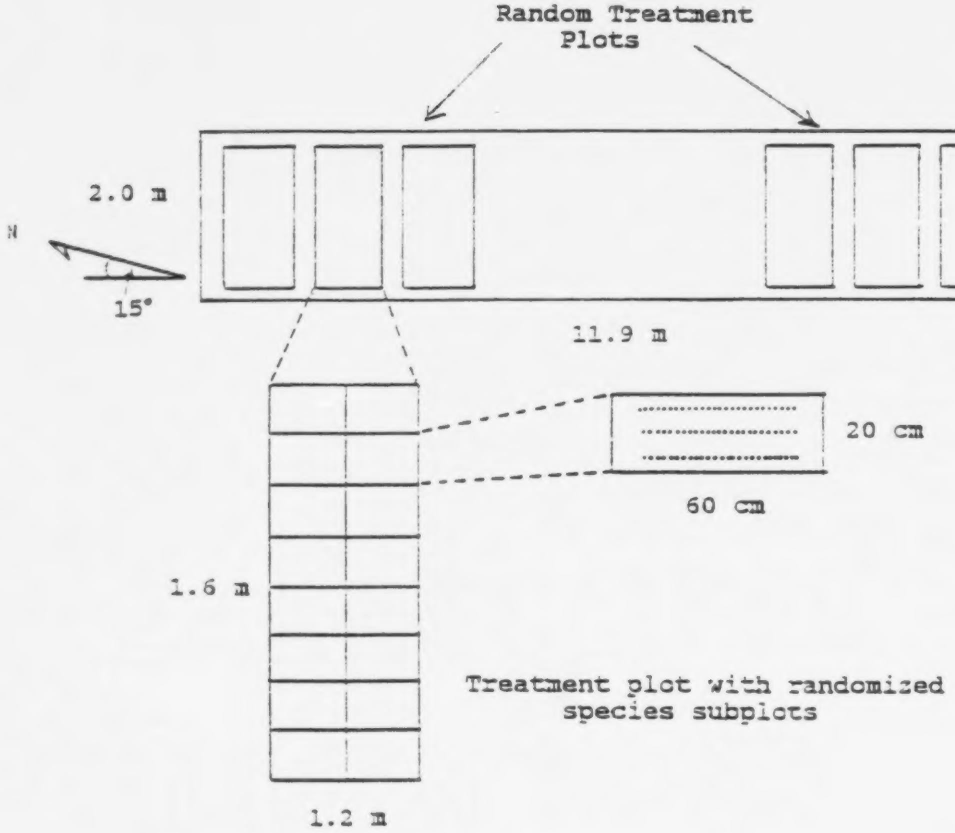

Random Treatment Plots
2.0 m
N
15°
11.9 m
20 cm
60 cm
1.6 m
Treatment plot with randomized species subplots
1.2 m

Fig. II-3. Experimental design of one of five sites (e.g., site A) located along the topographic gradient. Three replicates of two moisture treatments (control and irrigated) located randomly in treatment plots. Two species subplots, with 75 seeding positions in three rows of 25, located randomly within each treatment plot for all eight grass species.

moisture availability. Along a gradient of increasing moisture availability, the usual order of peak abundance is *Stipa comata*, *S. curtiseta*, *Agropyron dasystachyum*, *S. viridula*, *Festuca hallii*, and *A. trachycaulum* (pers. obs., S. Sask.). Voucher specimens are stored in the University of Alberta Herbarium (ALTA) in the Dept. of Botany.

Agropyron dasystachyum is a sod-forming species with long, creeping rhizomes, loosely tufted culms 4 to 13 dm in height, and narrow flat or involute leaves (Moss, 1983). It is a deep-rooted (110-152 cm, Coupland and Johnson, 1965), drought-resistant grass that prefers medium to coarse-textured sandy soils, but also performs well on shaley clays (Hardy BBT Ltd., 1989). This grass is common in the Northern Great Plains and intermountain area in the brown and dark brown soil zones of the Mixed-grass Prairie and Aspen Parkland ecoregions, predominantly in dry sites. Its distribution ranges from heavy-soiled valley bottoms to lighter-soiled hillsides in regions with at least 20 cm precipitation. Moreover, this grass is competitively excluded if the mean annual precipitation is greater than 46 cm (Hardy BBT Ltd., 1989).

Agropyron trachycaulum is a bunchgrass, 5 to 15 dm in height, with long, wide, flat leaf blades (Moss, 1983). Individuals are comparatively short-lived, have a tufted growth form, but are somewhat rhizomatous (Hardy BBT Ltd., 1989); and are rooted to a depth of 60-97 cm (Coupland and Johnson, 1965). This species is moderately to highly tolerant of alkaline soil conditions and although it is considered a mesophytic species, inhabits moist to semi-arid habitats of Canada and United States and prefers medium-textured, well-drained soils. It is common in areas of saline prairies and open woods (boreal forest to subalpine and subarctic) where annual precipitation is greater than 40 cm (Hardy BBT Ltd., 1989).

Festuca hallii forms large tussocks 3 to 9 dm in height, but it can spread by short rhizomes. The leaves are firm, scabrous, and involute (Moss, 1983). Rooting depth for this species is comparatively moderate (Coupland and Johnson, 1965) and its distribution is predominantly on moist, rich soils with a fine sandy loam to clay loam texture (Looman, 1969). This grass is found within the Canadian Aspen Parkland and on higher-elevation sites, and occasionally on moist north-facing slopes within the Canadian Mixed-grass Prairie region (Looman, 1982).

Stipa comata is a bunchgrass with flat or involute leaves and a height of 3 to 7 dm (Moss, 1983). It is moderate- (63-110 cm, Coupland and Johnson, 1965), to shallow-rooted (Potvin, 1984) and is abundant in areas with dry, sandy, coarse-textured soils (Coupland and Johnson, 1965). This is a very common species on dry sites within the prairie and parkland ecoregions of North America (Looman and Best, 1979).

Stipa curtiseta is a bunchgrass with flat or involute leaves and a height of 4 to 6 dm (Moss, 1983). It is rooted to a depth of 60-140 cm and usually has deeper roots than those of *S. comata* (Coupland and Johnson, 1965). It inhabits soils with greater moisture availability and more loamy texture than those of *S. comata* (Coupland, 1950). This species is common in moist grassland throughout the prairie, Aspen Parkland, and Rocky Mountain ecoregions, replacing *Stipa comata*, often as the dominant species, on these moister sites (Looman and Best, 1979).

Stipa viridula is a strongly tufted bunchgrass and a more mesophytic species than the other two *Stipa* species (Coupland, 1950). It has relatively wide leaves and attains a height of 4 to 8 dm (Moss, 1983). Its rooting depth is from 60-110 cm, usually similar to *S. curtiseta* (Coupland and Johnson, 1965). This grass is common in the prairie grassland on moist, clay-rich soils, particularly in sites that receive over 38 cm annual precipitation, although it may be found in areas that receive as little as 25 cm (Hardy BBT Ltd., 1989).

Stipa viridula var. Lodorm was developed in Mandan, North Dakota (United States Department of Agriculture, Northern Great Plains Research Laboratory) for use in reclamation because the native genotype possesses a high seed dormancy rate. This variety has a low dormancy rate and was used as a comparison to the local native genotype.

Bromus inermis is a strongly rhizomatous, introduced grass with broad, flat leaves and a height of 2 to 15 dm (Moss, 1983). It is a highly competitive grass introduced from Europe where it is common in moist meadows and woodlands and disturbance sites, such as shorelines and roadways (information from herbarium specimens). In North America it has been used extensively for agriculture, road-side planting, and reclamation. With this widespread distribution it has become a common invader of moist native grasslands and disturbed sites. For these reasons *B. inermis* also was used for comparison.

2.4.3. Seed Sources and Storage

Seeds of all species, except *Stipa viridula* (var. Lodorm), were collected from sites within the LML NWA in southern Saskatchewan in the summer of 1988 (1987 for *Festuca hallii*) (Appendix 3). The seeds were air-dried and stored at ambient outdoor temperatures, then transferred to hermetically-sealed containers in fall 1988 and stored at 2 °C.

2.4.4. Site Preparation and Maintenance

The experimental sites were ploughed to ca. 20 cm depth in late summer 1988 with a tractor-pulled rototiller, and early growth was sprayed with a herbicide ("Roundup") in spring 1989 to prepare a seed bed with little competition. The surface crust was broken and raked to produce a smooth soil consistency for seeding.

To provide adequate exclusion of mammalian grazers and burrowers, the five sites were individually fenced with one square inch mesh metal fencing to one metre in height; the bottom edge of the fence was buried just below the soil surface. The mesh size did not exclude small mice or grasshoppers. Mouse traps were used during the period of population explosion to greatly reduce the impact of mice on the grasses within the experimental sites.

To limit unwanted competition, any plant growth outside the planting pattern and within one metre of the edge of the treatment plots was eliminated to the ground surface or pulled out during the period between seed germination and biomass collection.

2.4.5. Planting

Prior to planting, seed lots were passed through an air-blast seed cleaner to remove chaff and light weight seeds. The seed lots were examined on a light table to remove empty caryopses not separated by the seed cleaner or, for those species with hard seed coats, were individually pinched with forceps to remove empty seeds. There were 450 seeds planted for each species, treatment, and site location combination. All seed material was untreated and unscarified. Within each species subplot, 75 seeds of one species were manually planted at 2 cm intervals and 1 cm depth within three rows spaced at 5 cm (Fig. II-3). Seeding began on 16 May 1989 and continued for 10 days on a species-by-species basis (i.e. planting of each species along the entire gradient was completed within a 24 hour period). This was facilitated by using a template with 75 1 cm plugs to create a standardized seeding design with consistent depths.

2.4.6. Data Collection

2.4.6.1. Climate

Climatological data were collected daily in the study area. Temperature data were collected from 21 May to 3 September 1989 with a maximum/minimum thermometer placed 1.5 m above the ground in a meteorological shelter similar to a Stevenson screen, located at the top of the catena. Precipitation data were collected from 11 May to 3 September 1989 with rain gauge collectors located at both ends of the topographic gradient. Climatological readings were made each morning to determine the maximum and minimum temperatures and the amount of precipitation during the previous 24 hour period.

2.4.6.2. Soil Moisture

Soil cores were collected for gravimetric moisture determination after a thoroughly soaking rain episode and during the period following which had no effective precipitation (i.e. surficial moisture which evaporated without penetration). 25 June 1989 received 28.72 mm of rain and soil coring began on 26 June (Day 1). Cores along the entire gradient were taken on Day 1, 3, 5, 7, and 12 (7 July 1989). A Day 33 coring was completed on 15 August 1989, separate from the other continuous coring series, after 33 days of no effective precipitation.

Three cores were taken at randomly selected sites between species subplots from within each control treatment plot with a 2 cm internal diameter Oakfield soil auger. This was completed at every topographic site during each day of sampling. The soil corer was sunk to 15 cm depth and 5 cm was removed from the top and bottom of the soil core extracted for the surface and deep soil strata samples, respectively. The samples were sealed immediately in separate plastic bags to prevent moisture loss. The soil cores from the ridge site (Site A) were halved for the two strata samples because soil compaction produced a 10 cm core from the 15 cm depth sampled. Sample wet weights were recorded on the day of collection. The samples were then air-dried and later oven-dried at 110 °C for more than 24 hours and weighed again. The wet and oven-dry weights of the samples were used to determine the moisture content as percentage dry weight at the time of collection.

Three replicates from pooled soil core samples passed through a 2 mm sieve were used for pressure plate analysis at known pressure potentials (-0.01, -0.02, -0.05, -0.075, -0.1, -0.2, -0.35, -0.5, -1.0, and -1.5 MPa). Water-holding capacity was determined at given water potentials and soil drying curves were produced for both soil strata at each site.

2.4.6.3. Soil Texture

Three surface soil samples collected to a depth of 15 cm and passed through a 2 mm sieve were used to analyze the soil texture at each site. The hydrometer method (McKeague, 1978) was used to determine the proportions of sand, silt, and clay in each sample.

2.4.6.4. Soil Chemistry

Two surface soil samples collected in May 1989 to a depth of 15 cm were pooled from each of the two middle treatment plots on either side of a site and passed through a 2 mm sieve to analyze the soil chemical properties at each site. Sample analyses included pH (with both H_2O and $CaCl_2$), cations (calcium, magnesium, sodium, and potassium), and electrical conductivity (Page et al., 1982); nitrate, ammonia, and phosphate (analysis of extract following Page et al., 1982 and readings made with a Technicon Auto Analyzer); total percent nitrogen and phosphorus (Kjeldahl digest method and analysis by Technicon Auto Analyzer); total percent carbon (Leco Carbon Analyzer, #CR12); and percent inorganic carbon (Warren, 1987). The chemical analysis was completed by the Soil Analysis Laboratory in the Dept. of Soil Science, University of Alberta.

2.4.6.5. Adjacent Native Vegetation

The native vegetation located adjacent to the experimental area (i.e. within 100 m) was used to determine the natural species abundance along the catena. Five linear transects, approximately 150 m long, were positioned perpendicular to the topographic gradient. The locations of the transects were established with a transit at the same elevations as the experimental sites. The lowland transect was taken alongside the lowland site (site E) because the land in this segment of the gradient had never been cultivated. Unlike the other transects, the one at site E followed the undulations of the landscape formed by an old beach front, thus remaining at a constant elevation.

A quadrat sampling device 1 m long and consisting of ten - 10 cm by 10 cm quadrats was used to obtain species presence data. Sampling locations along and to the left or right of the transect were determined by random number selections representing 1 to 10 m. Species presence was recorded for each 10 cm by 10 cm quadrat (i.e. each sampling location had ten adjacent quadrat samples). The number of quadrats sampled along each transect were: A-260, B-210, C-250, D-230, E-240. There were fewer quadrats sampled along transect B because the elevation dropped slightly near the end and the vegetation did not typify the major portion of the transect. Species presence data were collected between 11 and 17 July 1989 for transects A to D. Transect E was re-sampled at the new location on 17 August 1989 to reflect more accurately the vegetation and elevation similar to site E.

2.4.6.6. Germination and Survivorship

Upon the commencement of germination (*sensu* emergence) (5 June 1989), germinants were counted and marked with cohort-specific plastic or wooden markers at ca. weekly intervals during the major germination period and at ca. two week intervals subsequent to this period (5 June, 13 June, 26 June, 4 July, 18 July, 26 July, 10 August, and 3 September 1989). Data collection was completed within one to two days at each time interval. During each count of a new germination cohort, the number of survivors from each previous cohort were also recorded for seedling survivorship over time. In the second year, collection dates of germination and survivorship data were different. New germination cohorts were counted during the periods 17 to 21 May, 29 May, and 26 to 30 July 1990; numbers of survivors were recorded during the periods 22 to 25 May (1989 germination cohorts), 29 May (1990 germination cohorts), and 25 to 30 July 1990 (all germination cohorts). Due to the rapid invasion property of *Bromus inermis*, it was removed from the experiment with glyphosate in the spring of 1990. Therefore, there were no second year data for this species.

As part of an experiment not included in this thesis, seed of each study species, from the same lots used in the field experiment, were tested for germination in a growth chamber. Six replicates of 50 seeds were used for each species. Pretreatments included; seed scarification with 95% sulphuric acid for 8 minutes with *Stipa comata* and 10 minutes with *S. viridula*, and cold-moist stratification on moistened blotter papers in covered Petri dishes at 6 °C for two weeks. *S. comata, S. curtiseta*, and *S. viridula* were moistened with 0.055% gibberellic acid while the others were moistened with distilled water. All trays were re-moistened as needed with distilled water. After the pre-chill treatment, seed trays were transferred to growth chambers; one dark with a fluctuating diurnal air temperature of 30 °C and 15 °C with a 16 hour warm period for *S. viridula*; and the other with a fluctuating diurnal air temperature of 25 °C and 15 °C with a 16 hour warm photoperiod for the other species.

2.4.6.7. Harvesting and Biomass Determination

Above-ground biomass sampling was completed during the periods 22 August to 5 September 1989 and 17 to 23 July 1990. A subsample of 20 plants independent of cohort was collected by cutting individuals with scissors at the ground level. Collections were made in a systematic fashion by collecting all individuals in the middle row, except for two on each end. If more plants were needed, they were collected from the other two rows until all acceptable plants (i.e. not edge individuals) or the complete subsample were collected and individually bagged. Biomass samples were collected from one of the duplicate species subplots in each treatment plot along the entire gradient on a species-by-species basis. The bagged samples were air-dried and stored at ca. 20 °C. In the second year, biomass samples were collected in most cases from the alternate duplicate species subplot that was not harvested in 1989. The small amount of dead standing material that was remaining from the previous years growth was not separated from the biomass collected in the second year. Biomass samples were oven-dried at 65 °C for at least 48 hours and weighed individually to 1/1000 g on an analytical digital balance.

2.4.6.8. Tillers (1989)

The number of tillers (basal offshoots) produced per individual plant were counted from the plants being harvested for biomass determination at the end of the first field season during the period 22 August to 5 September 1989.

2.4.6.9. Inflorescences (1990)

The number of flowering culms produced per individual plant was recorded from the plants subsampled for above-ground biomass determination at the end of the second field season during the period 17 to 23 July 1990.

2.4.7. Statistical Analysis

Analysis of variance was used to analyze the 1989, 1990, and total germination data, and the soil texture data. Analysis of covariance (ANCOVA) was used to analyze the 1989 and 1990 biomass and survival data as well as the soil coring (1989), tiller (1989), and inflorescence

(1990) data. A multivariate analysis of variance (MANOVA) was used to analyze the soil chemistry data. The percentage soil chemistry data were transformed with an arc-sine square-root transformation prior to analysis. All analyses were performed with the SAS GLM (General Linear Models) statistical procedure (SAS, 1985). Least-squares means (LSM) (SAS, 1985) were used to make comparisons between treatments within each site and between sites along the catena. For the 1989, 1990 and total survival data, a SAS CATMOD (Categorical Modelling) procedure (SAS, 1985), similar to a goodness of fit test using the chi-square distribution, was used to make the latter comparisons. In this analysis, the proportion of survivors to mortalities was used to remove the effect of different total germination and compensate for the removal of all first germination cohort mortalities. These latter individuals were removed from the data set because some mortality was induced by an improper marking technique. All statistical analyses utilized data sets with the observed numbers and not percentages. A P value of 0.05, or less, was considered significant.

2.5. RESULTS

2.5.1. Climate: Precipitation and Temperature

Monthly mean temperatures in 1989 and 1990 were quite comparable to those of the 14 year average (1976 - 1989) at Last Mountain Lake National Wildlife Area (LML NWA) (Fig. II-4). Cold winters and warm summers typify this mid-continental site. Precipitation, however, in both 1989 and 1990 varied considerably from the average for the area (Fig. II-4). Monthly precipitation in 1990 was below normal for most months except the mid-summer period. Drought conditions were particularly evident in the spring and fall. In contrast, 1989 was distinguished by periods of above average precipitation in the spring and fall. Although the normals for LML NWA are the averages of only 14 years, they are comparable to those of the nearest long-term climatological station (Nokomis) located ca. 20 km ENE (Fig. II-5).

The climatological data collected daily in the study area revealed fluctuations in temperature and sporadic precipitation episodes during the 1989 field season (Fig. II-6). Higher precipitation amounts in the spring correlated with day/night temperatures conducive for germination in June. These temperatures appropriate for germination were also evident in late August to early Sept. when precipitation levels increased. The study area is located ca. 9 km SSE from the permanent climatological station for LML NWA and precipitation and temperatures were usually quite similar at the two stations (Appendix 4). The mean differences in maximum and minimum temperature were .4 °C and .5 °C, respectively. The greatest differences for one

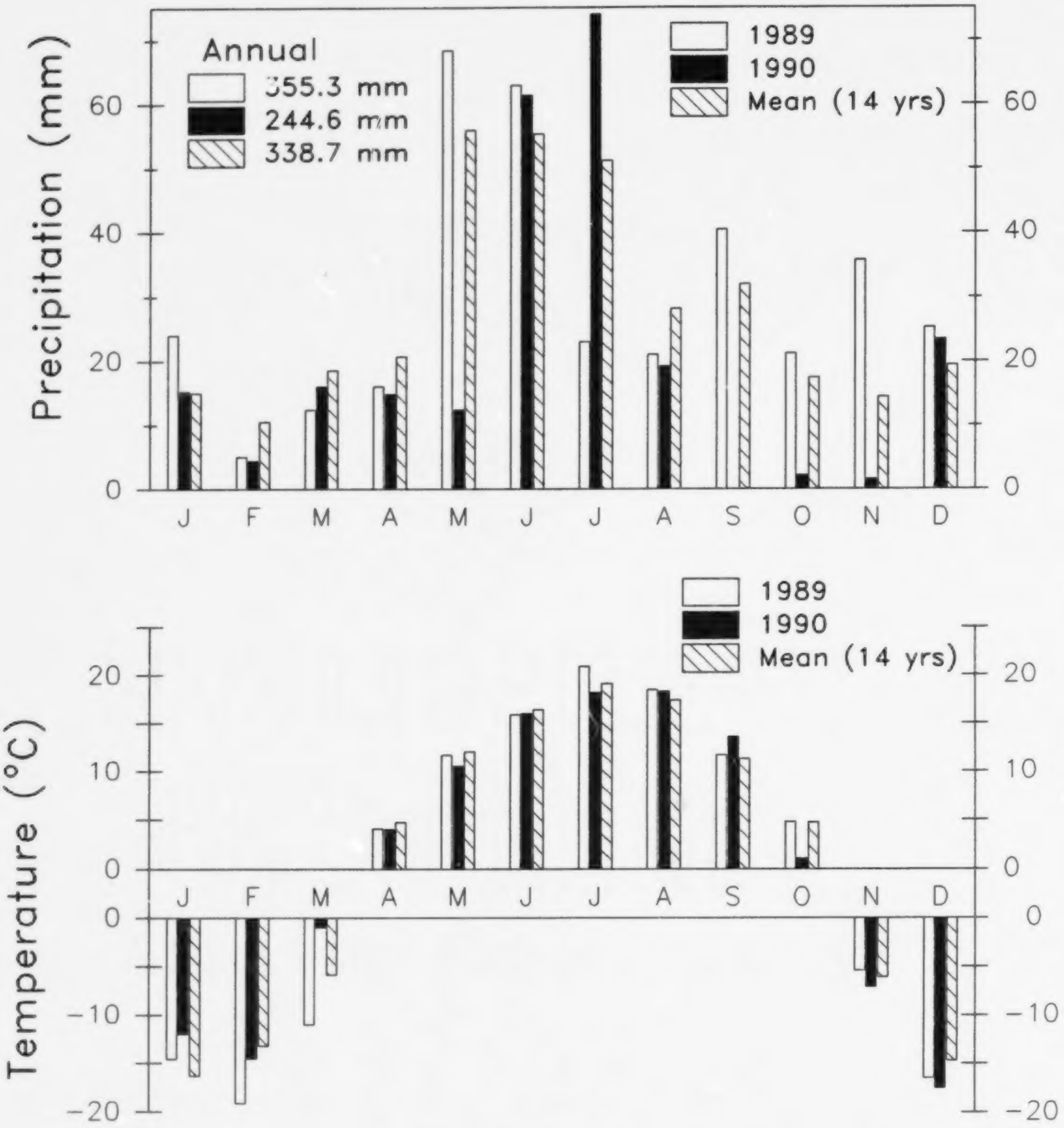


Fig. II–4. Monthly precipitation and mean temperatures in 1989 and 1990 compared to 14 year average (1976–1989) at Last Mountain Lake National Wildlife Area, Saskatchewan. (Means in Appendix 5–Table 2).

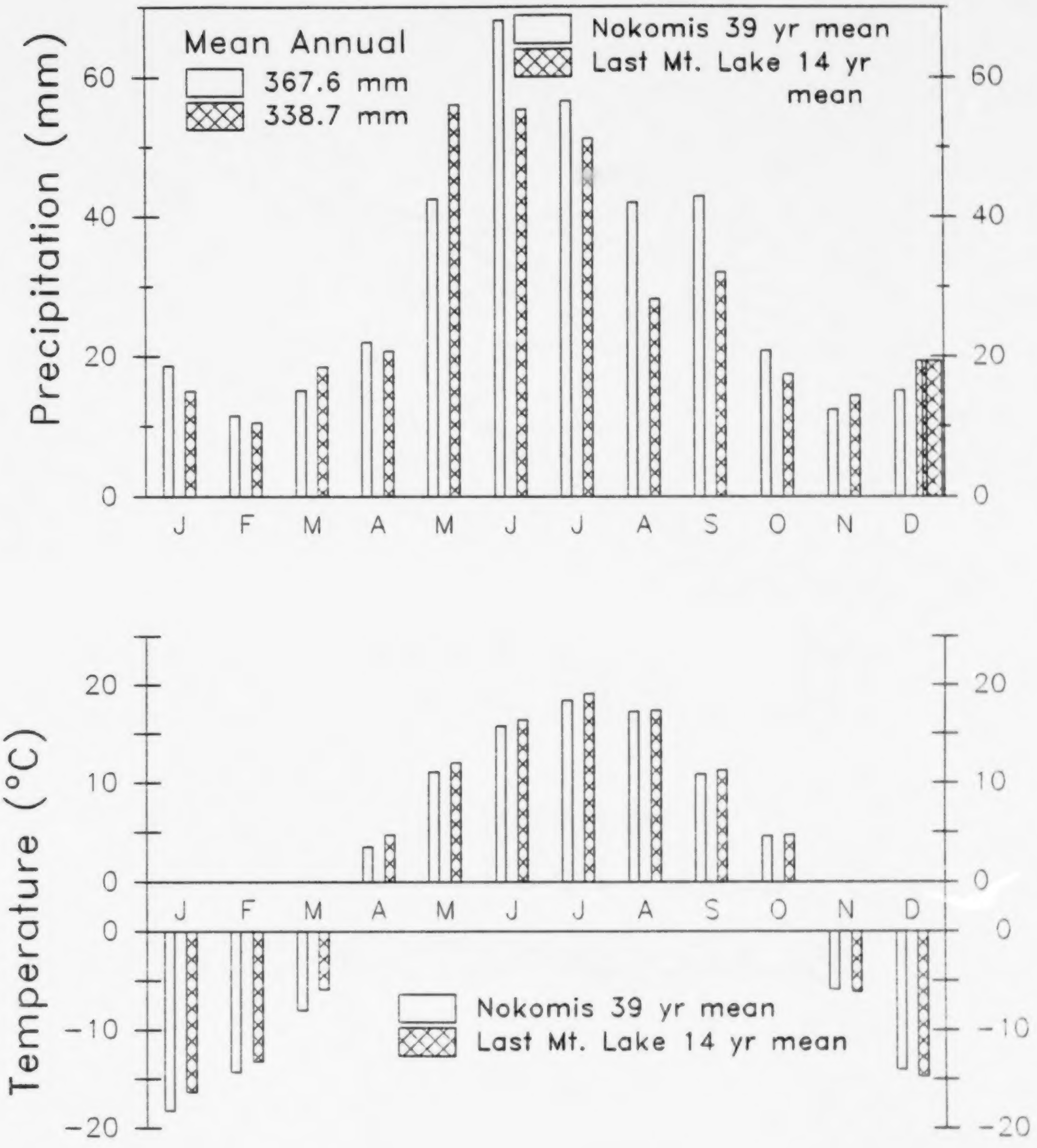


Fig. II–5. Monthly means of precipitation and mean daily temperatures for Last Mountain Lake National Wildlife Area (1976–1989) and Nokomis (1951–1989), Saskatchewan. (Means in Appendix 5–Table 2).

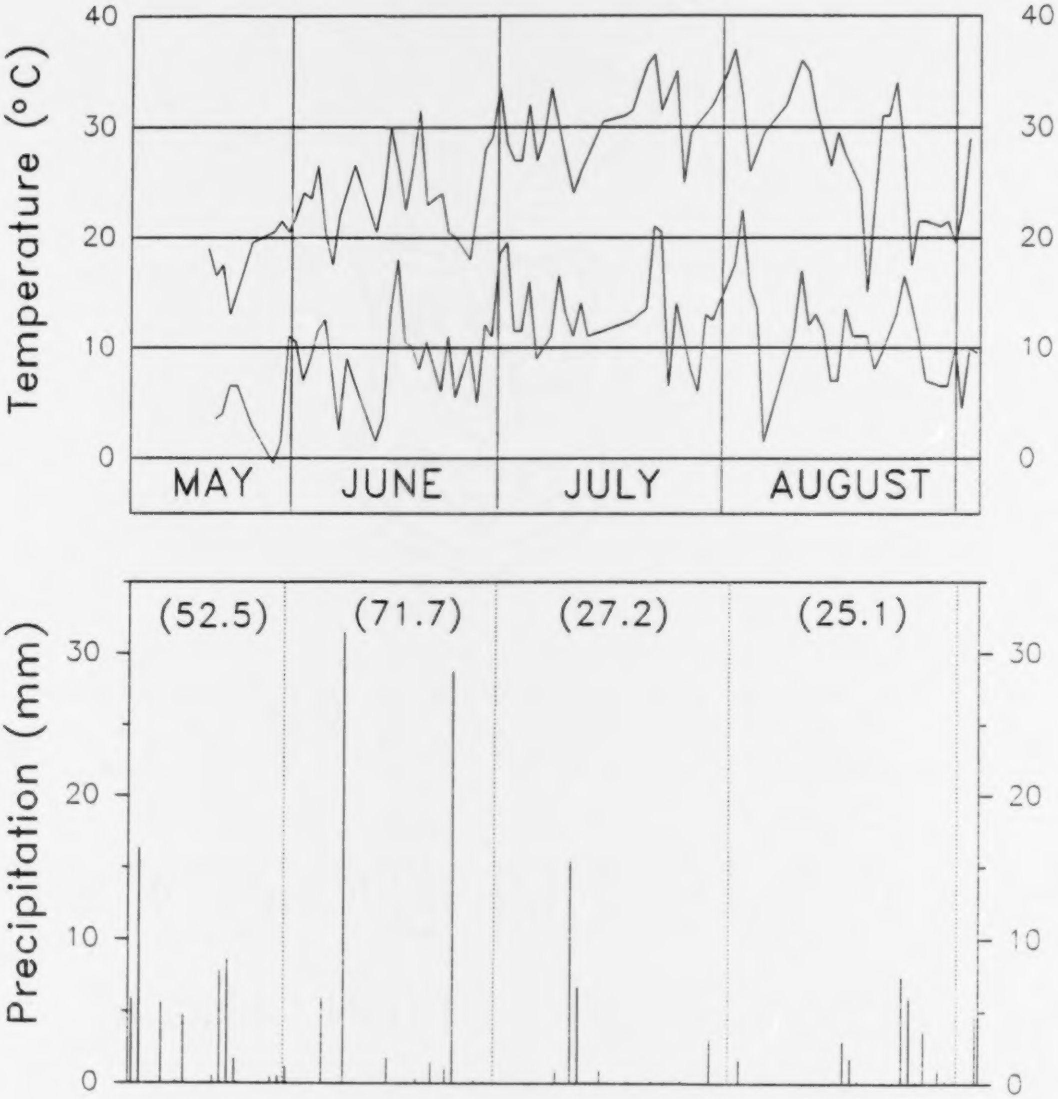


Fig. II–6. Daily maximum and minimum temperatures and precipitation levels at study area in Last Mountain Lake National Wildlife Area during 1989 field season (21 May to 3 Sept. and 11 May to 3 Sept., respectively). Values in brackets are total precipitation for each month or partial month. (Data points in Appendix 4).

day at the study area compared to the permanent station were +7 and -2.5 °C for maximum temperatures and +8 and -3 °C for minimum temperatures. The mean difference in precipitation was .02 mm and the greatest differences recorded for one day at the study site compared to the permanent station were +12.3 mm and -5.3 mm.

2.5.2. Soils

2.5.2.1. Soil Profile Descriptions

Differences in soil development and classification along the catena are evident from the soil profile descriptions at the five sites (Fig. II-7 and Appendix 1). All five profiles belong to the Chernozemic order (Agriculture Canada Expert Committee on Soil Survey, 1987). The upper A and B and lowland E profiles belong to the Dark Brown great group, while the middle C and lower D profiles belong to the Black great group. The mid-slope (site C) and lowland (site E) segments both had shallow impediments to root penetration. The soil mid-way along the catena had a heavy clay boundary starting at 12 cm below the soil surface while in the lowland the mottling rose to 12 cm below the soil surface indicating periodic anaerobic conditions at this depth and below.

2.5.2.2. Soil Moisture Gradient

Pressure plate analysis performed on pooled soil core samples produced soil drying curves which revealed the soil water potential at given soil moisture contents for each treatment and site (Fig. II-8). The soils at some sites had the capacity of drying to a lower level at a higher (less negative) water potential. The difference in water holding capacity between the surface and deeper soil strata was minimal (Fig. II-8).

The soils along the catena dried out at different rates (ANCOVA, $p=0.0001$); at all locations the surface soil (0-5 cm) dried out more quickly than did the deeper stratum (10-15 cm) (ANCOVA, $p=0.0001$). Without substantial precipitation over a one month period, the soil water potential dropped to below -1.5 MPa at all sites and in both soil strata sampled, except the deeper soil in the lowland (Fig. II-9). Initially the drying of the surface soil was greater at the mid (site C) and lower slope (site E) positions, but over time it was the upper slope which became drier, especially site B. The drying trend of the deep soil strata was again initially greater at the mid-slope position (site C) and the other upper slope positions, but after one month the deeper soil of site B and then A became the driest, as for the upper surface soil layers, and the deeper stratum of site D became drier than the shallow clay B horizon of site C.

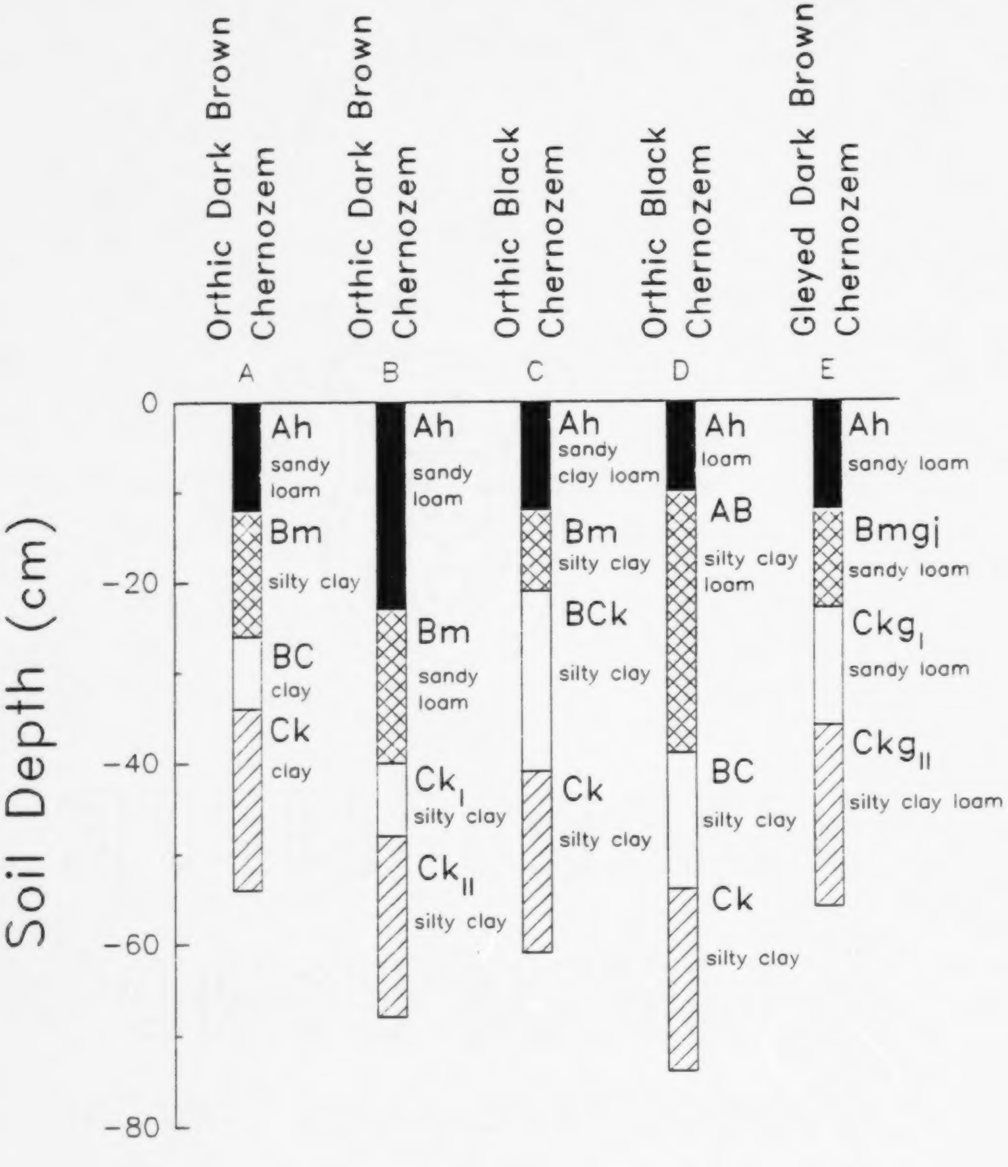


Fig. II–7. Soil profiles at sites along topographic gradient (A=ridgetop). See Appendix 1 for soil profile descriptions. The depth of the lower horizon is undetermined.

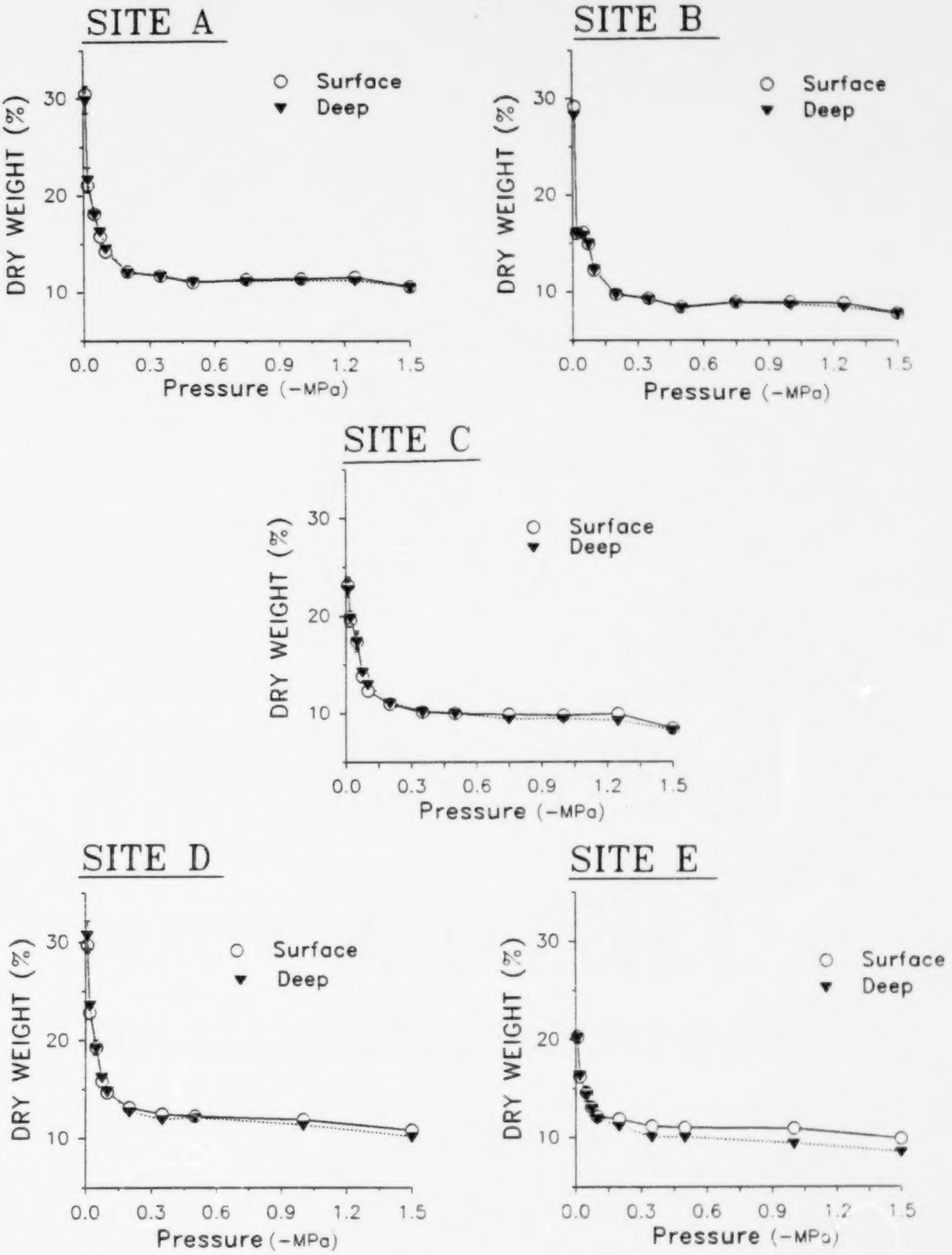


Fig. II−8. Mean (n=3) and S.E.M. of soil moisture content (percentage of soil dry weight) from surface (0−5cm) and deeper (10−15cm) soil strata exposed to given pressure potentials. (Means and standard errors in Appendix 5−Table 3).

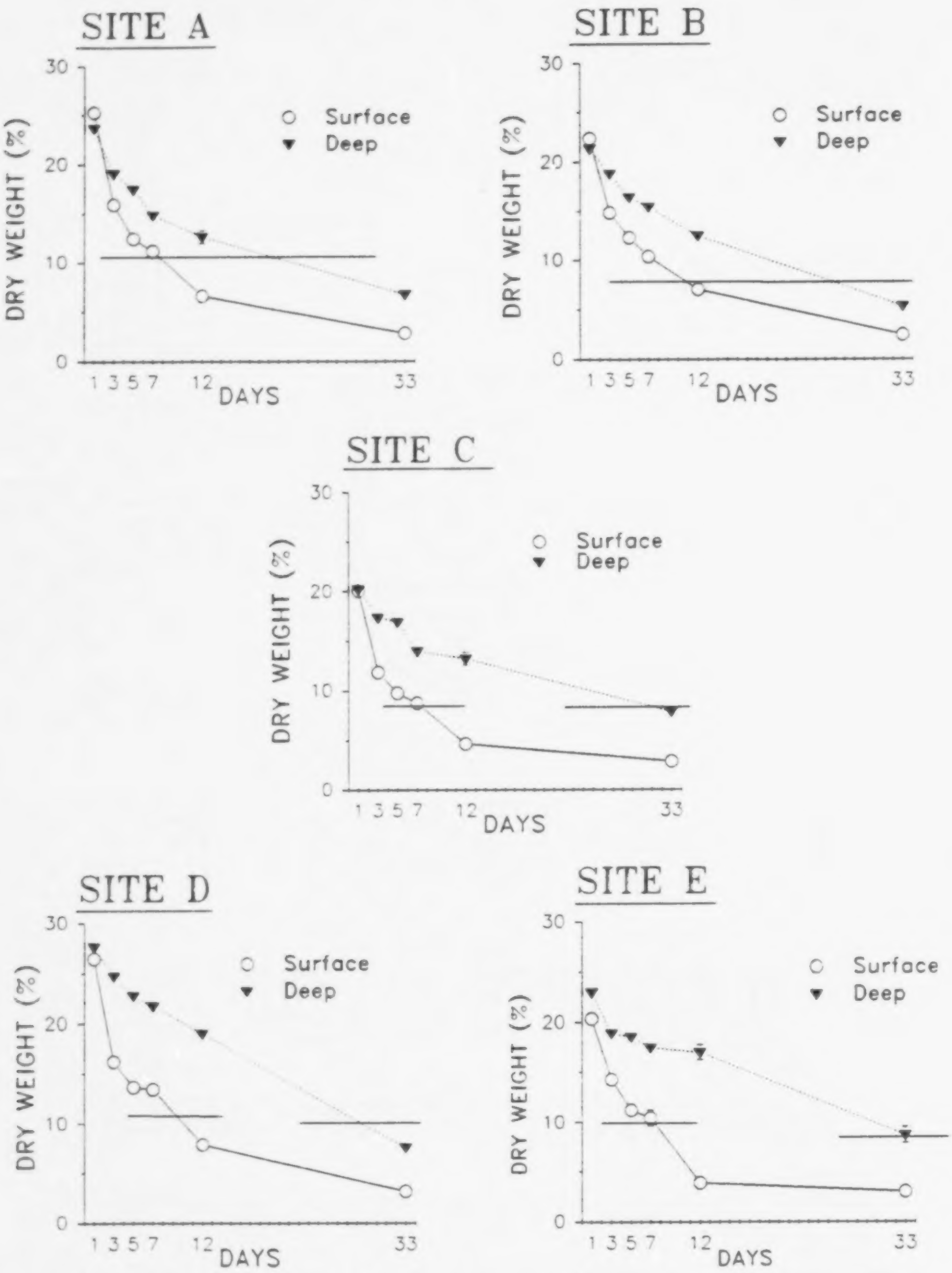


Fig. II–9. Mean (n=9) and S.E.M. of the moisture content (percentage of soil dry weight) of soil cores at five locations along the topographic gradient. Cores from surface (0–5 cm) and deeper (10–15 cm) soil strata within control moisture treatment plots collected from a time series during a period of non–effective precipitation after a thoroughly soaking rain (Day 0). The horizontal and vertical lines illustrate the point at which a water potential of −1.5 MPa was reached. (Means and standard errors in Appendix 5–Table 4).

2.5.2.3. Soil Texture

The soils along the catena were predominantly of a sandy loam texture, although differences in the surface textural components of the soils at sites C and D classified these as a sandy clay loam and loam, respectively. The lowland site E had the most sand and the least of both clay and silt, while site D upslope was the reverse with the least sand and the most silt and clay (Fig. II-10). The upper slope sites A, B, and C were very similar to each other. The ridgetop site A was the only site with any great amount of pebbles and small rocks near the soil surface. An ANOVA revealed that there was no significant difference in texture among the five sites. A least-squares means (LSM) comparison of the texture types showed no difference in the amount of clay along the catena, but the amount of silt was similar only between sites B and C and the amount of sand among the three upper slope positions was not significantly different (Fig. II-10).

2.5.2.4. Soil Chemistry

A MANOVA showed a significant topographic gradient effect in many of the soil chemical attributes (Table II-3). A Ryan-Einot-Gabriel-Welsch multiple-range test (REGWQ) (SAS, 1985) found the pH, phosphate (PO_4), calcium (Ca), and total inorganic carbon levels of the lowland site E to be quite different from the rest of the catena. Although not significantly different, the electrical conductivity (EC), magnesium (Mg), sodium (Na), and to some extent, ammonia (NH_4) and total carbon levels were higher and the potassium (K) lower in the lowland site E compared to the rest of the catena (Fig. II-11).

2.5.3. Adjacent Native Vegetation

Species presence data from quadrat sampling in the native vegetation adjacent to the experimental sites revealed substantial changes in species distribution along the topographic gradient (Table II-2). The species composition along transect E was distinct from the rest of the gradient in that it was composed of a large number of alkali tolerant mesophytic species. Transects A and C were typified by an abundance of xerophytic species (e.g. *Agropyron smithii, Carex filifolia, Stipa comata*, and *Selaginella densa*) while transects B and D had a relatively greater abundance of more mesophytic species (*Bromus inermis, Poa pratensis, Agropyron trachycaulum, A. dasystachyum, Stipa curtiseta, S. viridula*, and *Symphoricarpos occidentalis*).

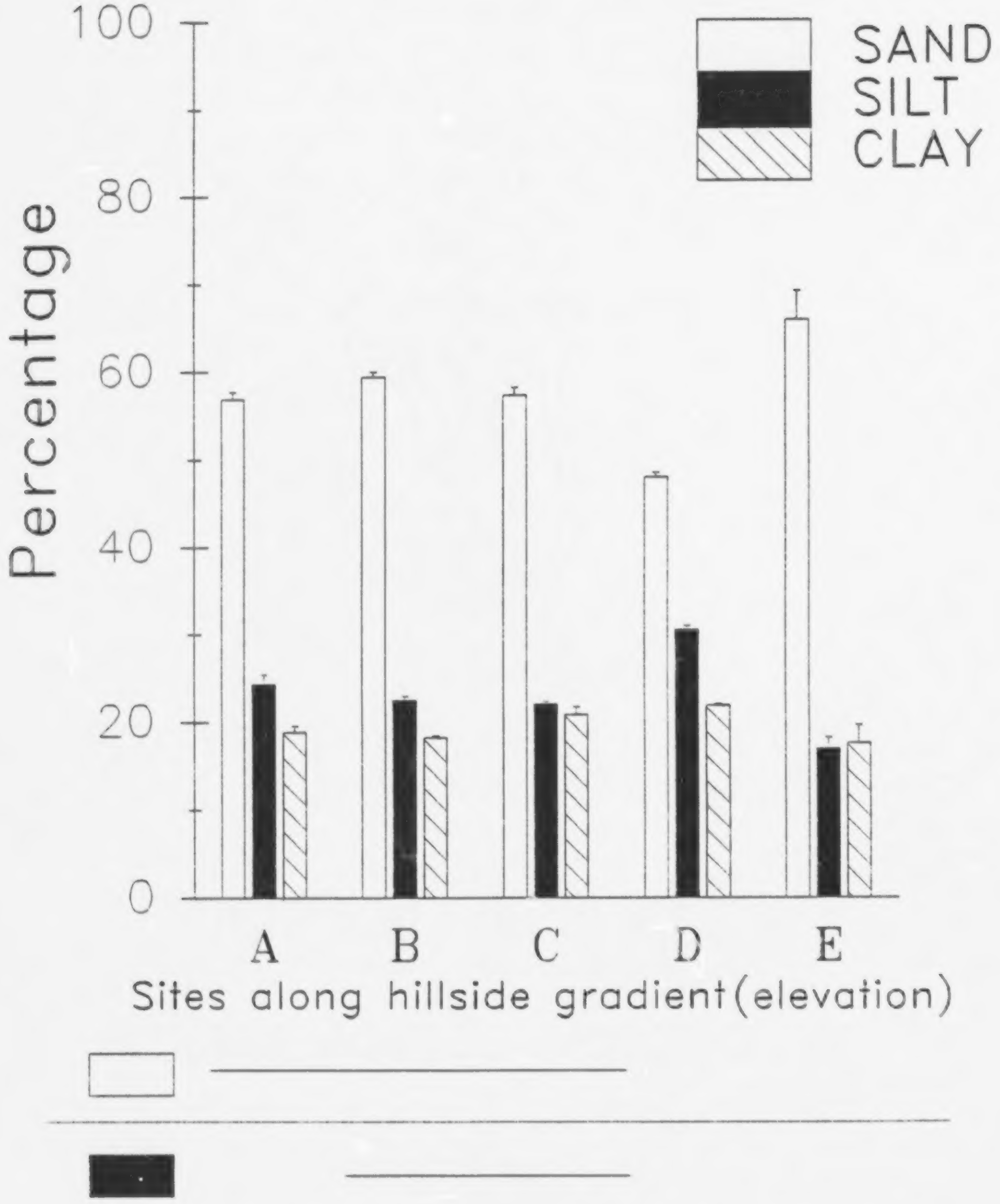


Fig. II–10. Proportional composition of surface (0–15 cm) soil texture from locations along the topographic gradient. Lines connect means which are not significantly different (least-squares means comparison). Textures along the gradient are: A–sandy loam (coarse), B–sandy loam (fine), C–sandy clay loam, D–loam, E–sandy loam (Agriculture Canada Expert Committee on Soil Survey, 1987. (Means and standard errors in Appendix 5–Table 5).

Table II-3. Summary of MANOVA results for soil chemistry.* The source of variation was the site effect.

Soil property	DF	SS	MS	F	Pr>F
pH (H_2O)	4	1.51	0.38	25.82	0.002
pH ($CaCl_2$)	4	2.12	0.53	57.53	0.0002
EC (mS/cm)	4	3.18	0.80	3.68	0.09
NO_3 (μg/g)	4	327.53	81.88	5.54	0.04
NH_4 (μg/g)	4	5.47	1.37	2.20	0.20
PO_4 (μg/g)	4	124.97	31.24	31.54	0.001
Ca (μg/g)	4	18041691.0	4510422.75	16.09	0.005
Mg (μg/g)	4	150443.6	37610.9	3.83	0.09
Na (μg/g)	4	224631.0	56157.8	2.82	0.14
K (μg/g)	4	82923.4	20730.9	7.78	0.02
Total % C	4	0.003	0.0007	12.27	0.009
Total % N	4	0.0001	0.00003	19.19	0.003
Total % P	4	0.00001	0.000003	1.25	0.40
Total % Inorganic C	4	0.01	0.003	12.85	0.008

* See Methods section 2.4.6.4 for details and 2.4.7 for analysis methods.

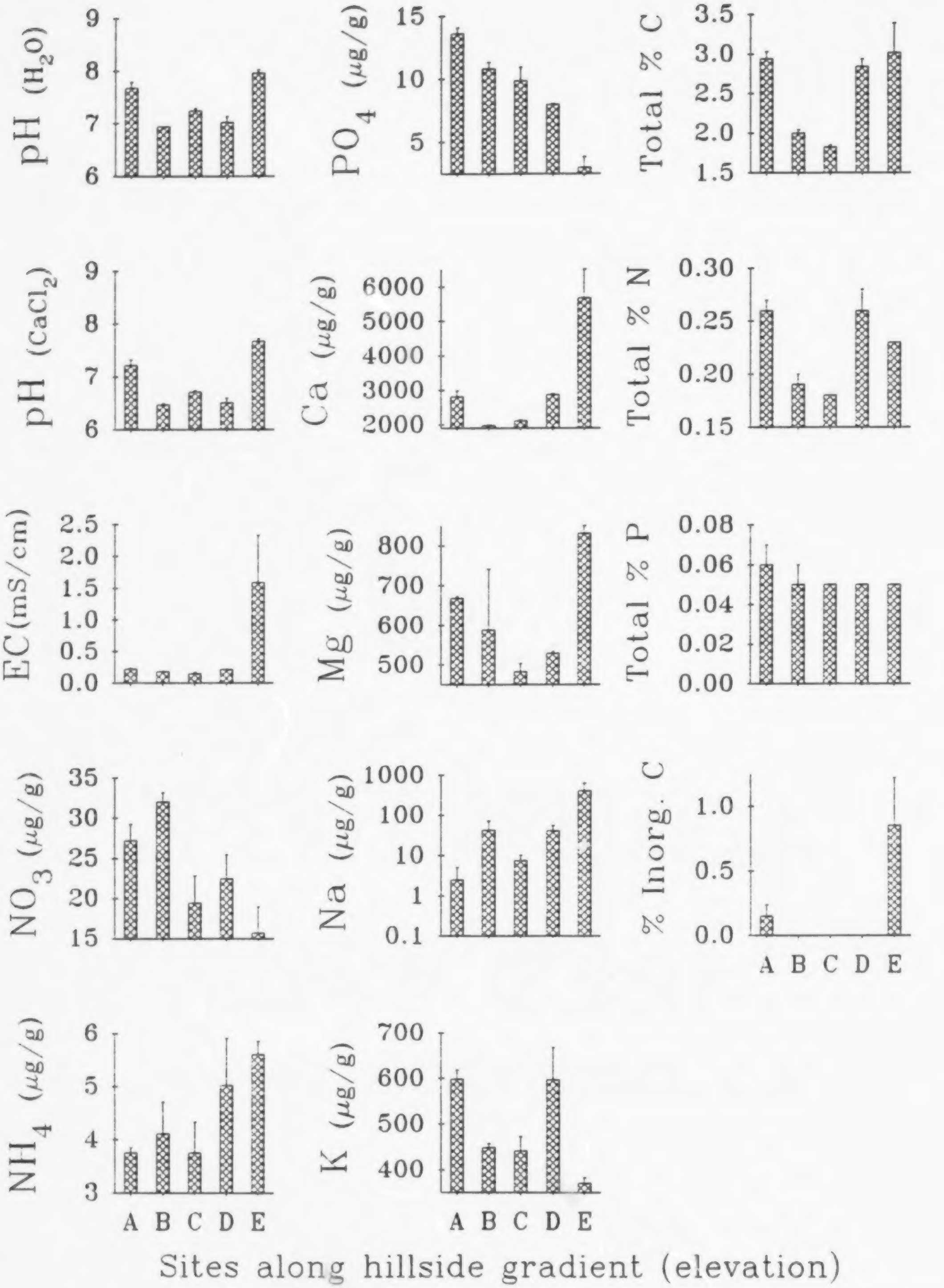


Fig. II–11. May 1989 soil chemical properties of surface soil samples (0–15 cm) at sites along the topographic gradient. (Means and standard errors in Appendix 5–Table 6).

2.5.4. Germination (*sensu* emergence)

2.5.4.1. 1989 Germination

There was a higher proportion of germination in the four soft-seeded grass species (*Agropyron dasystachyum, A. trachycaulum, Bromus inermis*, and *Festuca hallii)*, in which germination only occurred in the first spring, than in the three species with indurate seed coats (*Stipa comata, S. curtiseta*, and *S. viridula*), in which varying levels of germination continued after the initial spring germination period (Fig. II-12).

The topographic gradient (site effect) significantly affected the germination of three species (*Festuca hallii, Stipa viridula* (Lodorm), and *S. comata)*; the first two of these revealed site x treatment interactions caused by the differential effect of irrigation in the sites at the gradient extremes (dry and alkaline) and at the mid-slope (hard soil) position (Table II-4). Germination in *Stipa comata* increased downslope (Fig. II-12b).

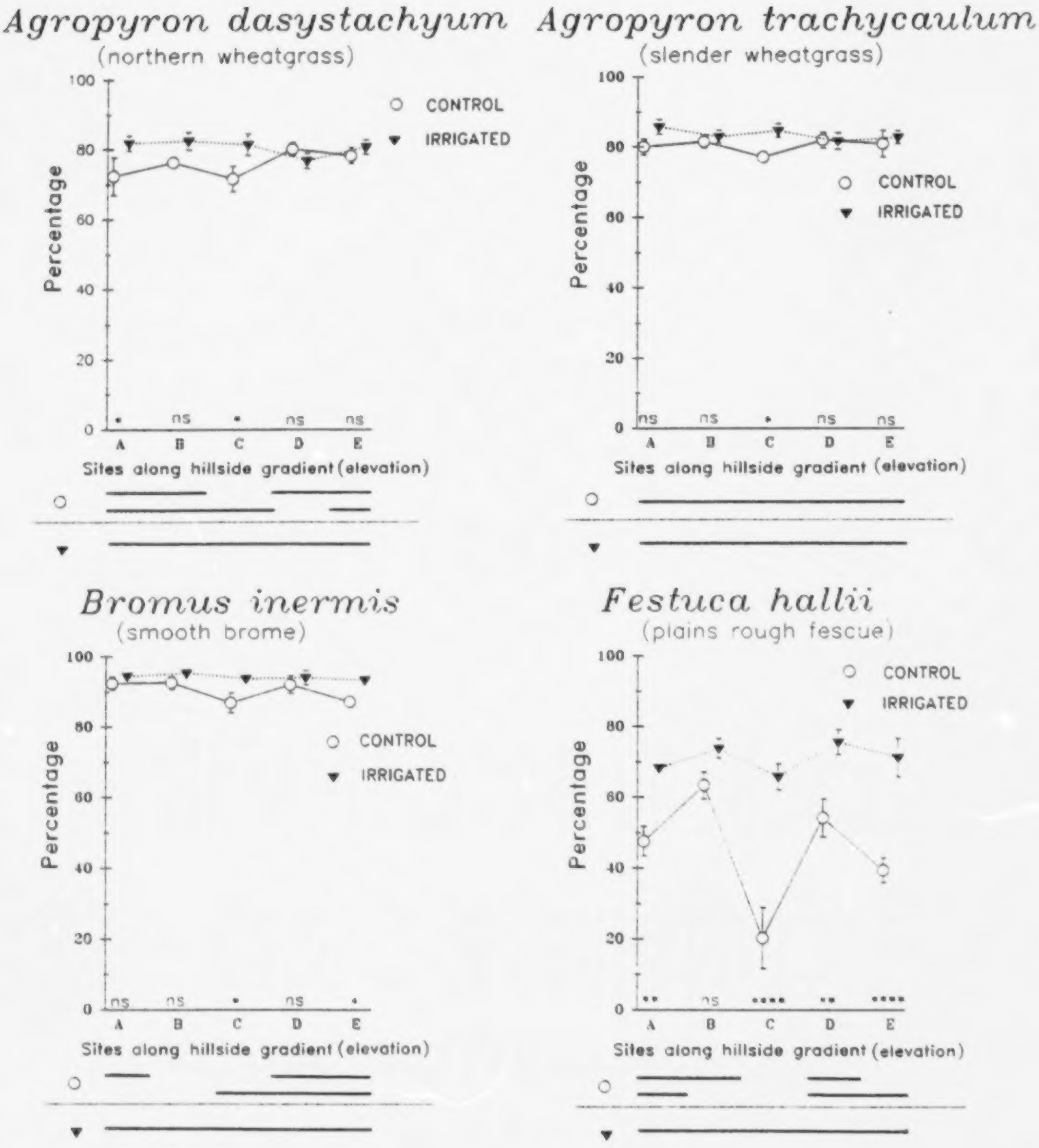
There was a significant treatment effect produced by irrigation for all species (Table II-4). However, this effect was isolated to certain sites in each species (LSM, Fig. II-12). The sites where irrigation was most effective were those with dry, coarse-textured soil (site A), extreme alkalinity (site E), and the mid-slope location (site C) which had a hard soil surface.

2.5.4.2. 1990 Germination

In the second year, germination occurred only in the *Stipa* spp. (Fig. II-13) and was significantly influenced by position on the catena in all three species (Table II-5). The effect of position was particularly evident by the lower germination in *Stipa comata* and *S. viridula* along the upper segment of the catena (Fig. II-13). The irrigation treatment in 1989 also had a significant effect on all of these grasses (Table II-5); however, on a site-by-site basis, only *Stipa comata* demonstrated a significant treatment effect along the entire catena, with consistently greater numbers of germinants in the control as compared to the 1989 irrigation treatment plots (LSM, Fig. II-13).

2.5.4.3. Cohort Germination (1989 and 1990)

Germination was concentrated mainly in the moist spring period of the planting year, but in species with strong dormancy (caused by indurate seed coats) there was substantial germination in the spring of the second year and some germination recorded during the rest of the growing season in both the first and second year (Fig. II-14). Irrigation usually hastened seed germination and increased the total number of germinants. In the two grasses with more germination in the second year (*Stipa comata* and *S. viridula*), the number of germinants was significantly lower in the treatment plots that had been irrigated the previous year (Fig. II-14b).


Agropyron dasystachyum (northern wheatgrass)

Agropyron trachycaulum (slender wheatgrass)

Bromus inermis (smooth brome)

Festuca hallii (plains rough fescue)

Fig. II–12a. Mean (n=6) and S.E.M. of total germination (75 seeds planted) during the 1989 field season (16 May to 3 Sept.–the year of seeding) under control and irrigated moisture treatments at five locations along the topographic gradient. Significance levels for difference between moisture treatments at each gradient location are listed on the x–axis (ns=not significant, *=≤0.05, **=≤0.01, ***=≤0.001, ****=≤0.0001). Lines connect means which are not significantly different (least–squares means comparison). (Means and standard errors in Appendix 5–Table 7).

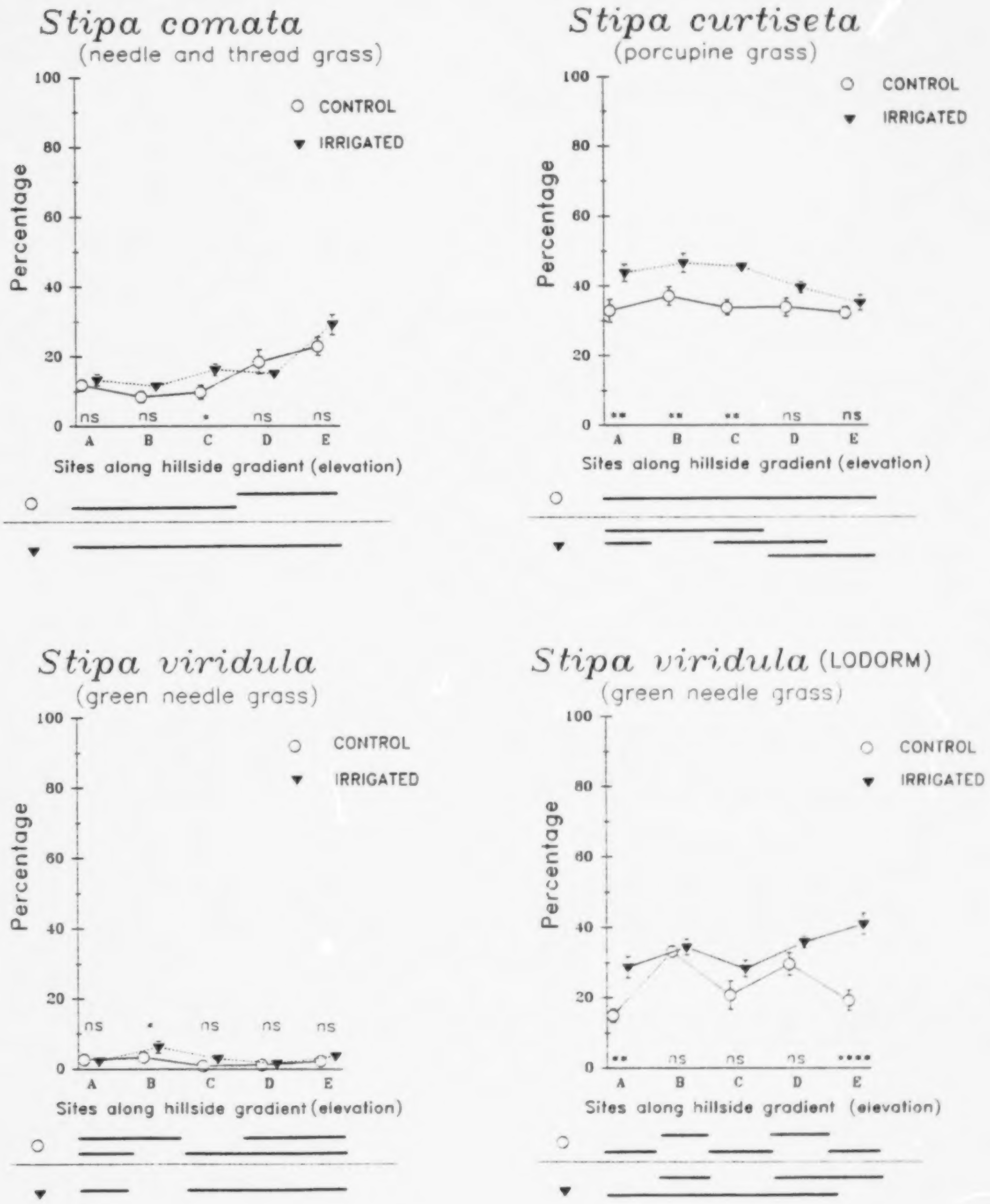


Fig. II–12b. Same as Fig. II–12a. (Means and standard errors in Appendix 5–Table 7).

Table II-4. Summary of ANOVA results for seed germination in 1989.*

Source	DF	SS	MS	F	Pr>F
Agropyron dasystachyum:					
Site	4	49.93	12.48	0.29	0.88
Moisture	1	205.35	205.35	8.6	**0.01**
Site x Moisture	4	199.07	49.77	2.08	0.13
Agropyron trachycaulum:					
Site	4	14.56	3.64	0.35	0.84
Moisture	1	79.43	79.43	4.86	**0.04**
Site x Moisture	4	74.99	18.75	1.15	0.37
Bromus inermis:					
Site	4	86.57	21.64	1.40	0.30
Moisture	1	132.02	132.02	24.37	**0.0002**
Site x Moisture	4	38.90	9.73	1.80	0.18
Festuca hallii:					
Site	4	2706.29	676.57	5.66	**0.012**
Moisture	1	5514.89	5514.89	113.01	**0.0001**
Site x Moisture	4	1140.46	285.12	5.84	**0.005**
Stipa comata:					
Site	4	1059.17	264.79	26.26	**0.0001**
Moisture	1	66.15	66.15	4.16	0.06
Site x Moisture	4	108.43	27.11	1.70	0.20
Stipa curtiseta:					
Site	4	258.27	64.57	2.14	0.15
Moisture	1	558.15	558.15	42.02	**0.0001**
Site x Moisture	4	96.27	24.07	1.81	0.18
Stipa viridula:					
Site	4	47.23	11.81	1.79	0.21
Moisture	1	14.02	14.02	9.04	**0.009**
Site x Moisture	4	11.57	2.89	1.87	0.17
Stipa viridula (Lodorm):					
Site	4	746.60	186.65	7.05	**0.006**
Moisture	1	874.12	874.02	41.32	**0.0001**
Site x Moisture	4	421.73	105.43	4.99	**0.009**

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* See Methods for details and section 2.4.7 for analysis methods.

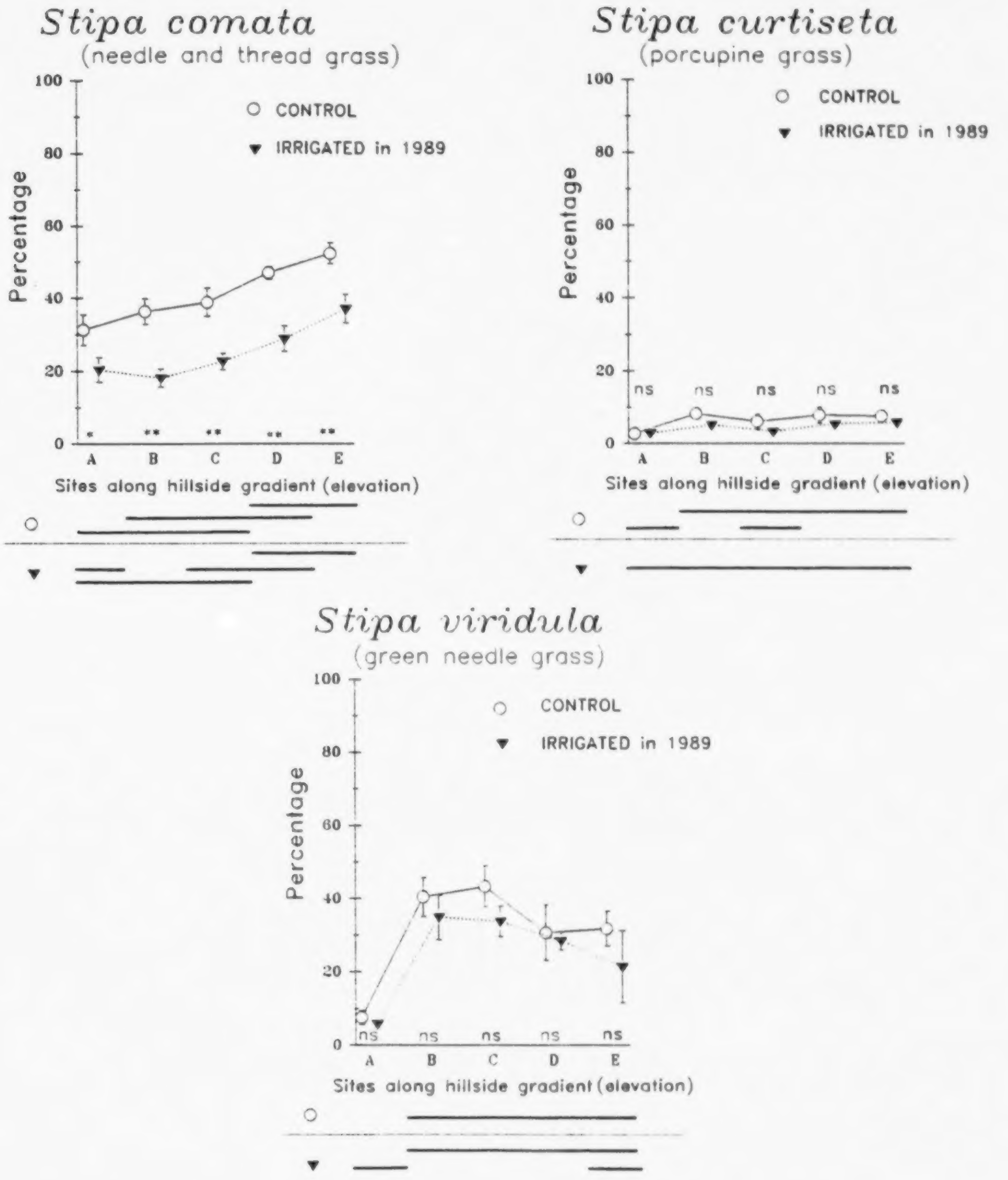
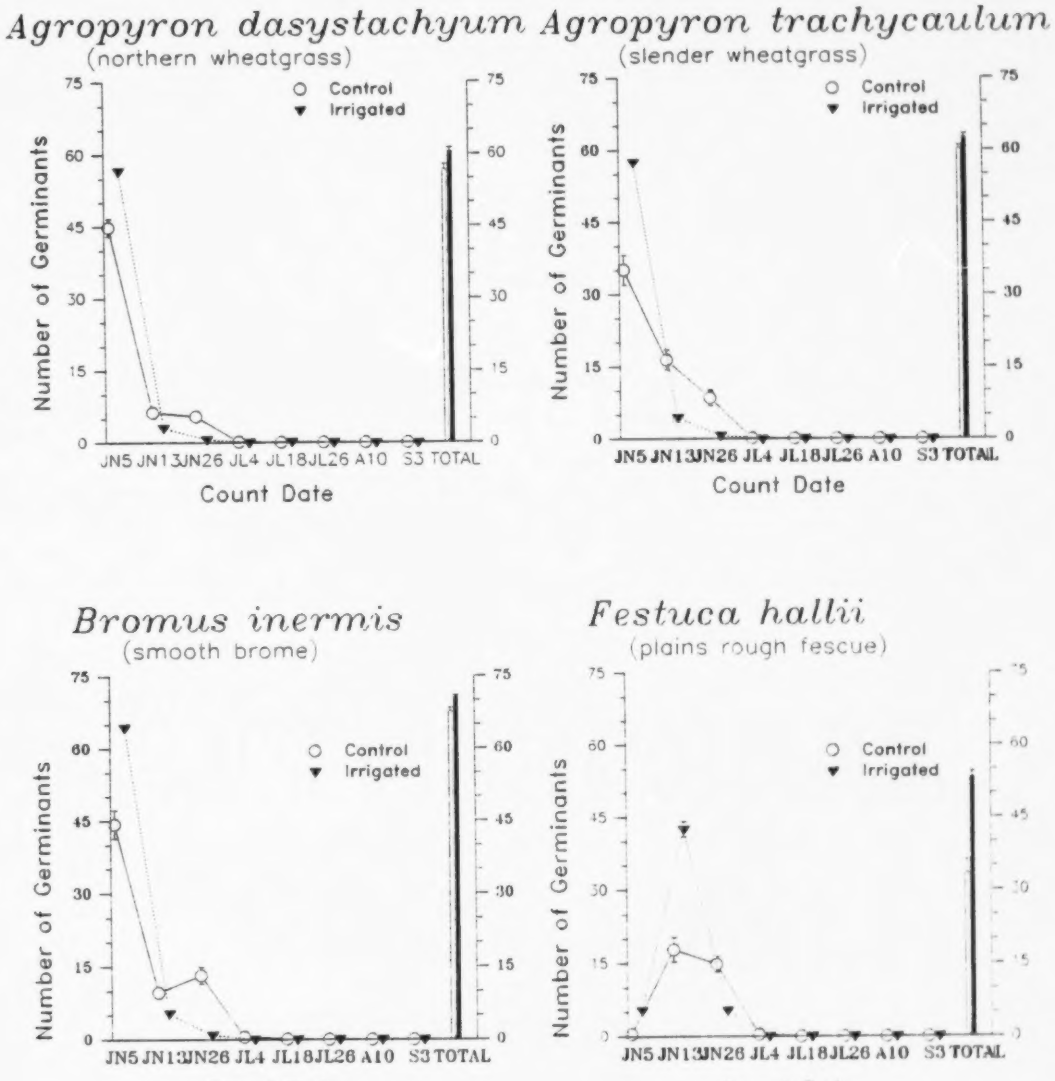


Fig. II−13. Mean (n=6) and S.E.M. of total germination (percentage of original 75 seeds planted) during the 1990 field season (17 May to 30 July − the second year after seeding) from control and previously irrigated moisture treatments at locations along the topographic gradient. Significance levels for difference between previous moisture treatments at each gradient location are listed on the x−axis (ns=not significant, *=≤0.05, **=≤0.01, ***=≤0.001, ****=≤0:0001). Lines connect means which are not significantly different (least−squares means comparison). (Means and standard errors in Appendix 5−Table 8).

Table II-5. Summary of ANOVA results for seed germination in 1990.*

Source	DF	SS	MS	F	Pr>F
Stipa comata:					
Site	4	1668.23	417.06	9.76	0.002
Moisture	1	2076.82	2076.82	138.61	0.0001
Site x Moisture	4	59.77	14.94	1.0	0.44
Stipa curtiseta:					
Site	4	80.57	20.14	27.47	0.0001
Moisture	1	32.27	32.27	5.8	0.03
Site x Moisture	4	11.57	2.89	0.52	0.72
Stipa viridula:					
Site	4	4483.90	1120.98	8.96	0.002
Moisture	1	294.82	294.82	4.94	0.04
Site x Moisture	4	109.10	27.28	0.46	0.77

* See Methods for details and section 2.4.7 for analysis methods.


Agropyron dasystachyum (northern wheatgrass)

Agropyron trachycaulum (slender wheatgrass)

Bromus inermis (smooth brome)

Festuca hallii (plains rough fescue)

Fig. II–14a. Mean (n=30) and S.E.M. of the number of new germinants at each cohort count date (1989\1990) for moisture treatment plots (irrigation treatment occurred in 1989 only) from all five topographic gradient locations. Bars represent the mean (n=30) and S.E.M. of total germination within unirrigated (☐) and irrigated (■) moisture treatment plots during the two year period. Months are M=May, JN=June, JL=July, A=August, and S=September. (Means and standard errors in Appendix 5–Table 9).

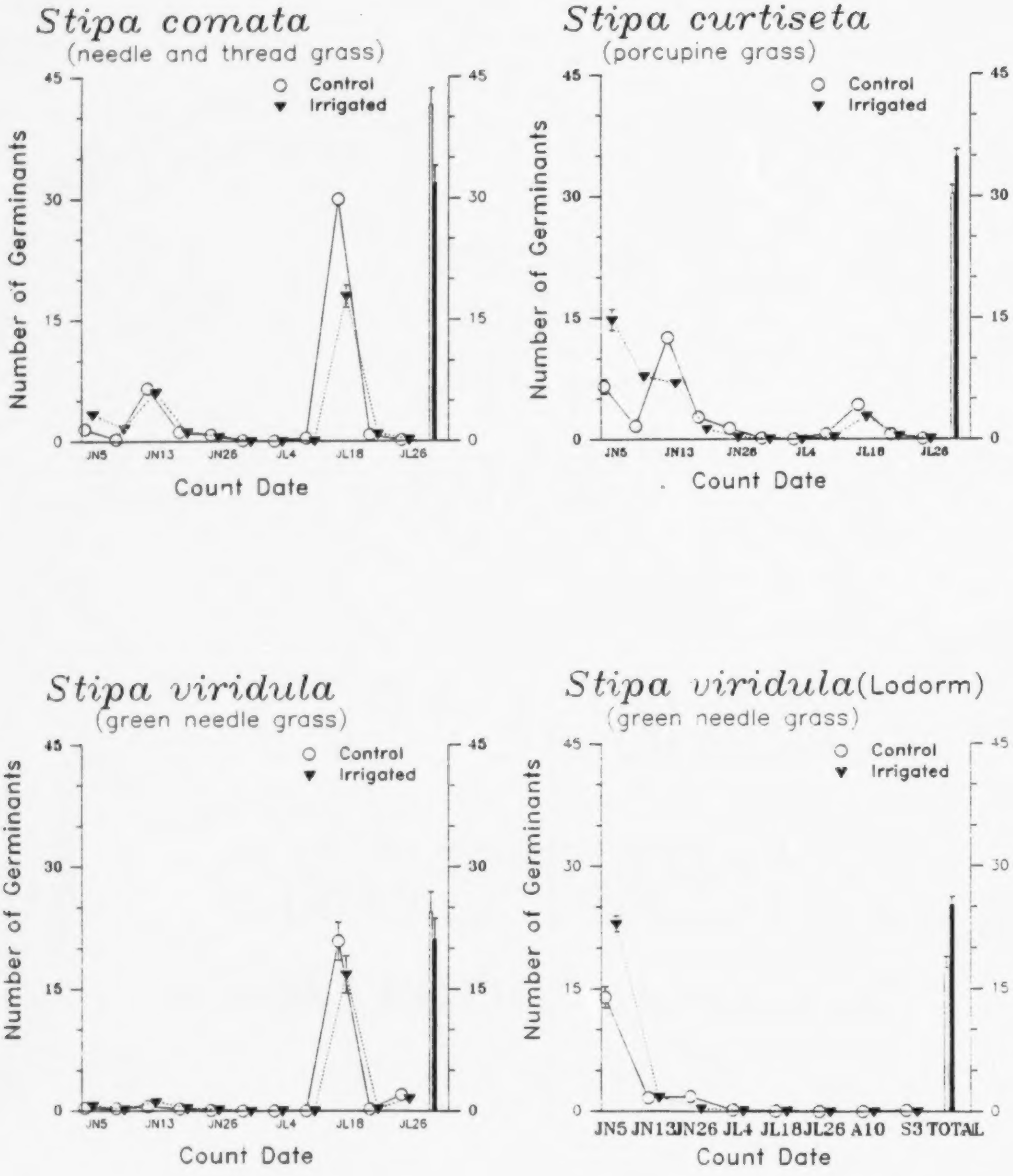


Fig. II–14b. Same as Fig. II–14a. (Means and standard errors in Appendix 5–Table 9).

2.5.4.4. Total Germination (1989 and 1990)

The total germination obtained for each species during the two years of field research (Fig. II-15) reflected the results obtained in the year with the most germination because the majority of germination occurred in one year or the other. For most species, prolific germination occurred during the first year, which for the soft-seeded grasses was their only period of germination. Among the native needle grasses, which all attained germination to some degree in the second year after planting, only *Stipa curtiseta* had a higher proportion of germination in the first year. Although the needle grasses were capable of germinating in the second year and throughout both growing seasons, higher total seed germination, in almost all cases, occurred in the four soft-seeded species (Fig. II-15).

The means of growth chamber germination tests of the study species seed lots, following methods described in section 2.4.6.6, and how these laboratory results related to those obtained in the field over two years, were: *Agropyron dasystachyum* - 72.8 (same), *A. trachycaulum* - 81.0 (same), *Festuca hallii* - 54.9 (same to lower), *Stipa comata* - 82.2 (much higher), *S. curtiseta* - 59.0 (slightly higher), *S. viridula* - 99.4 (considerably higher), *Bromus inermis* - 94.6 (same). Higher laboratory germination rates of the *Stipa* spp. may indicate seed of these species remained dormant in the field for longer than two growing seasons

2.5.5. Seedling Survivorship

2.5.5.1. Survivorship of 1989 Germinants

Seedling survivorship during the first year was very high for most of the grasses, with only *Festuca hallii* showing substantial mortality during this period (Fig. II-16). A small *Stipa viridula* population produced by lower germination created greater variations in survivorship within each site and along the catena.

The mortality of germinants was usually higher in the controls on the upper slope of the catena, especially in *Agropyron trachycaulum* and the other soft-seeded species. A greater number of species were particularly affected by the harder soil of the mid-slope position (site C) and the alkaline lower slope position (site E) (SAS CATMOD, Fig. II-16). The irrigation treatment significantly reduced mortality in most species, with the exception of *Stipa curtiseta* and *S. viridula* (Lodorm) (Table II-6). As with the germination results, a significant irrigation effect was not observed at every site (SAS CATMOD, Fig. II-16), with the exception of *Festuca hallii.*

In most species there were a few individuals that senesced before the last survivorship count and were recorded as mortalities. It was not until the next growing season that these minor discrepancies could be determined.

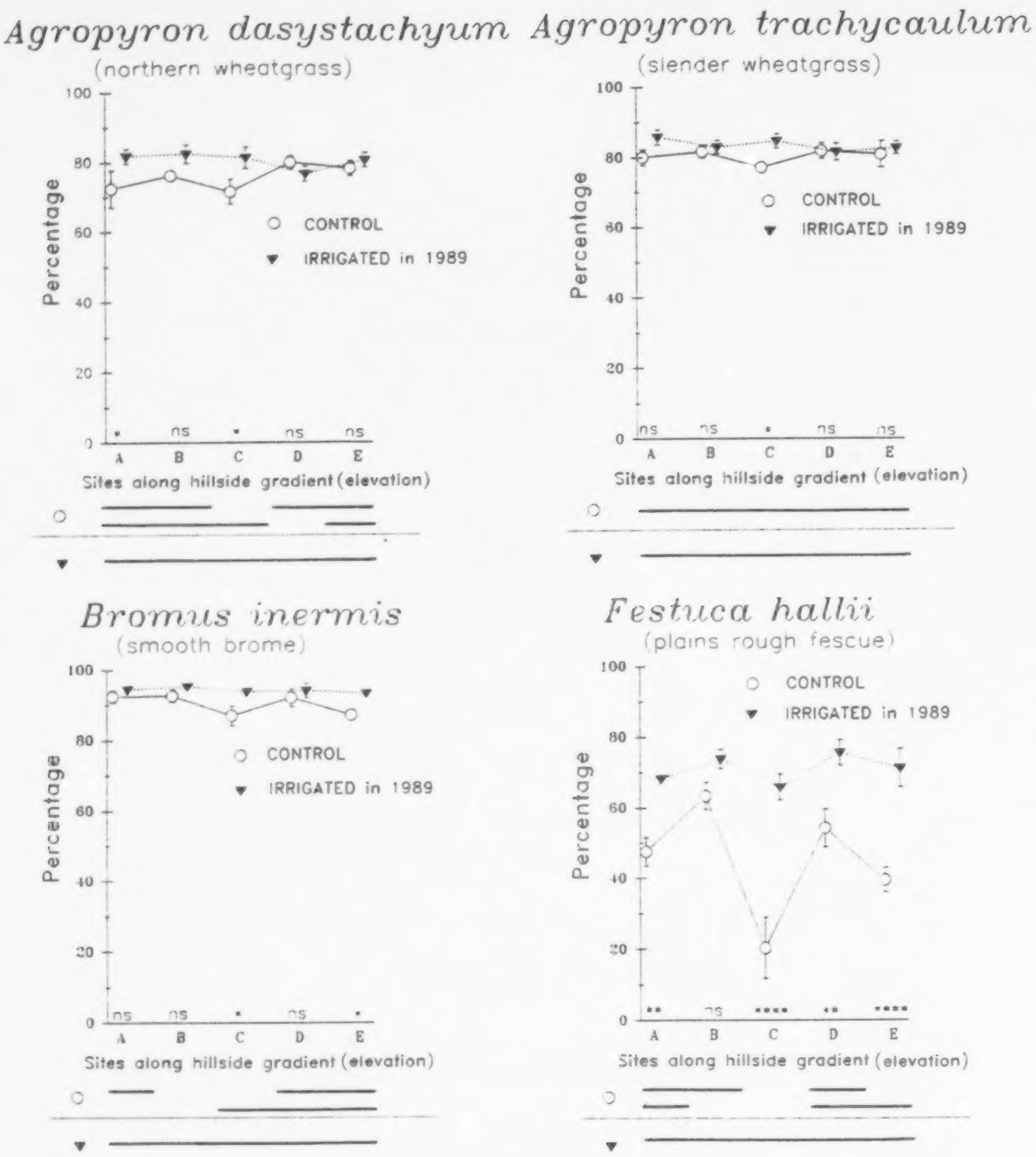


Fig. II−15a. Mean (n=6) and S.E.M. of total germination during the two year period (1989 and 1990) under control and irrigation (active in 1989 only) moisture treatments at five locations along the topographic gradient. Significance levels for difference between moisture treatments at each gradient location are listed on the x−axis (ns=not significant, *=≤0.05, **=≤0.01, ***=≤0.001, ***=≤0.0001). Lines connect means which are not significantly different (least−squares means comparison). (Means and standard errors in Appendix 5−Table 10).

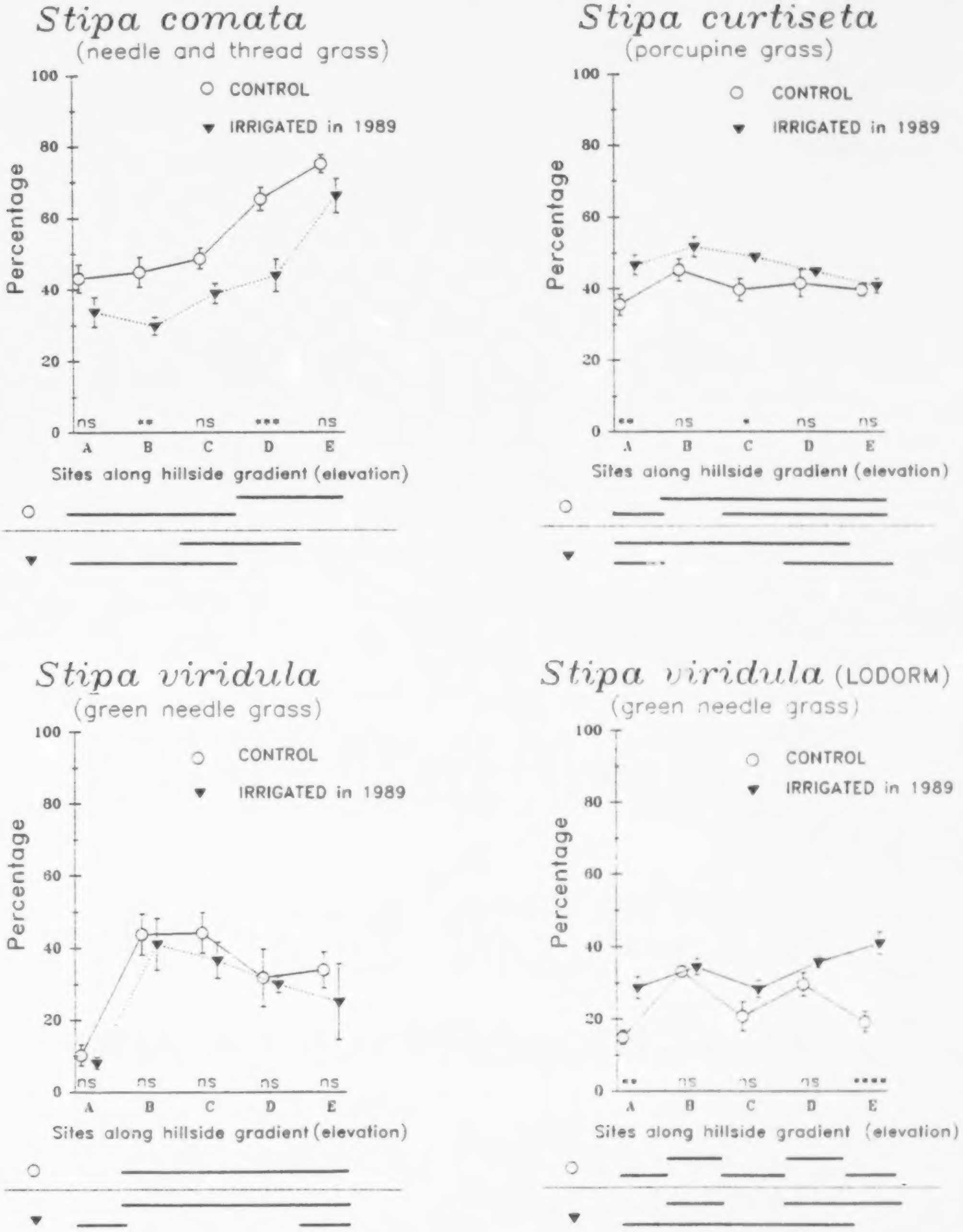


Fig. II–15b. Same as Fig. II–15a. (Means and standard errors in Appendix 5–Table 10).

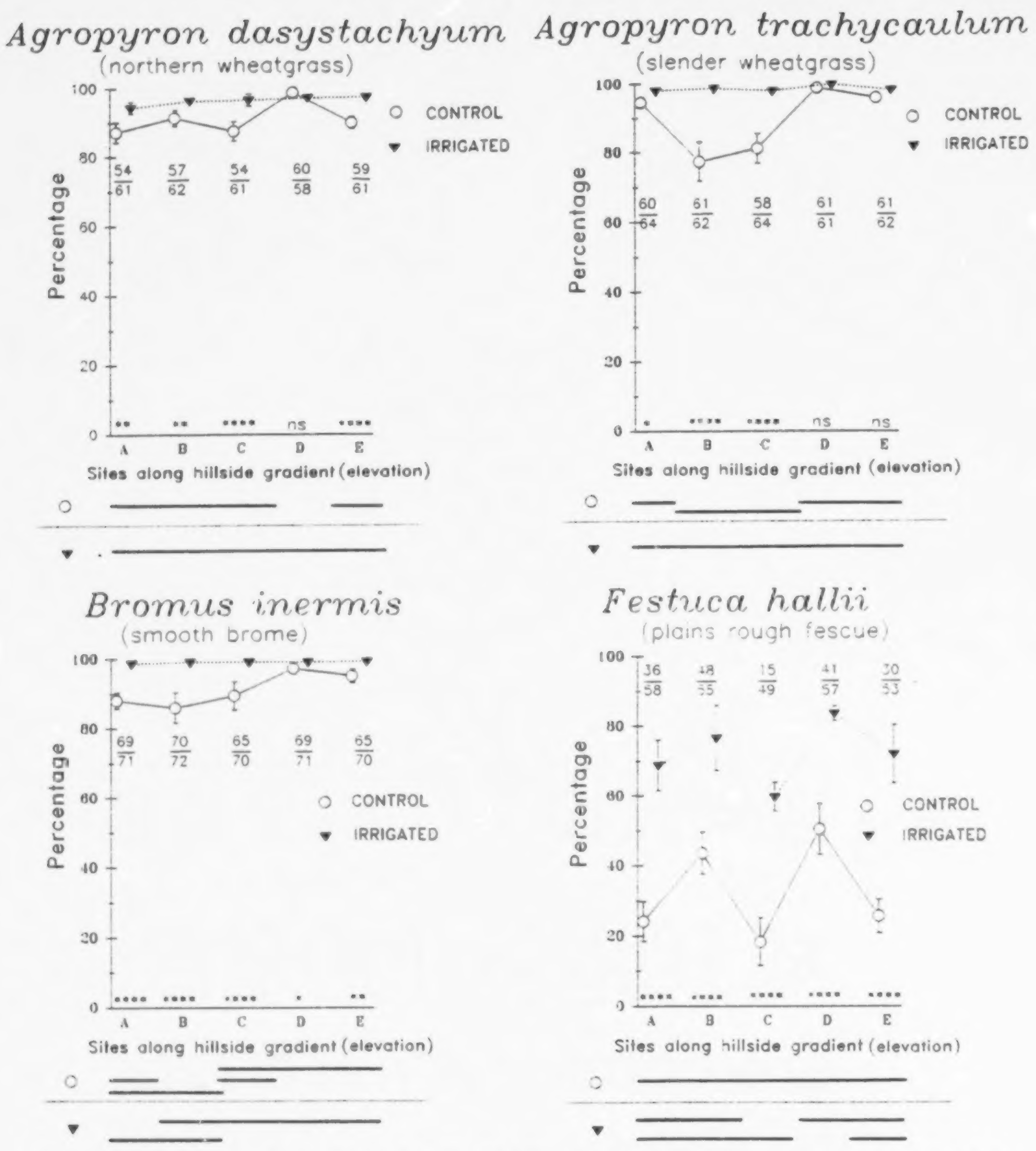


Fig. II–16a. Mean (n=6) and S.E.M. of total survivorship (percentage of number of germinants) at the end (3 Sept.) of the 1989 field season (first growing season) under control and irrigated moisture treatments at five locations along the topographic gradient. Significance levels for difference between moisture treatments at each gradient location are listed on the x–axis (ns=not significant, *=≤0.05, **=≤0.01, ***=≤0.001, ****=≤0.0001). Numbers represent mean number of germinants during 1989 in control (top) and irrigated (bottom) moisture treatments. Lines connect means which are not significantly different (least–squares means comparison). (Means and standard errors in Appendix 5–Table 11).

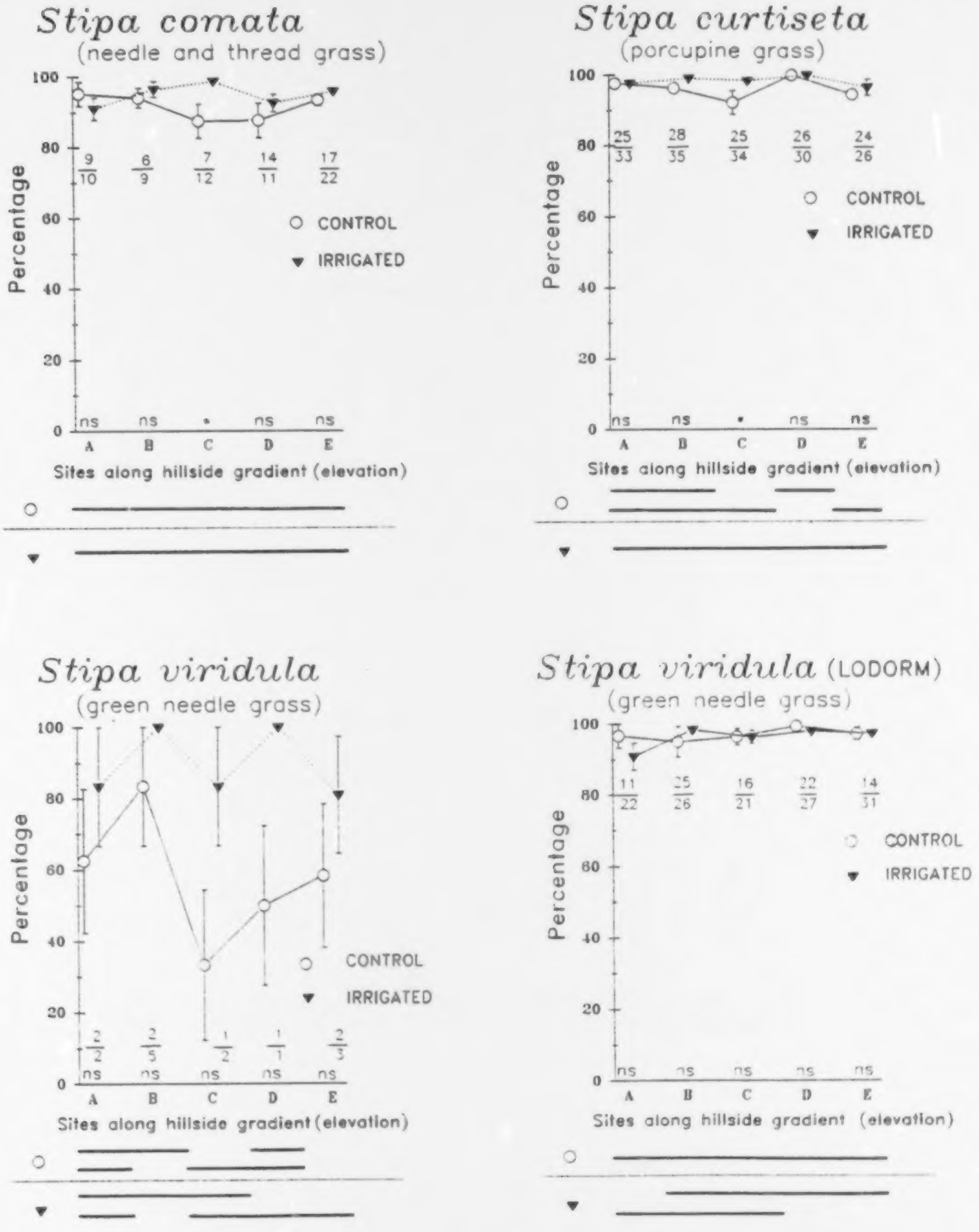


Fig. II–16b. Same as Fig. II–16a. (Means and standard errors in Appendix 5–Table 11).

Table II-6. Summary of ANCOVA results for total survivorship at the end of the 1989 field season. Total germination was used as the covariate.[*]

Source	DF	SS	MS	F	Pr>F
Agropyron dasystachyum:					
Site	4	223.23	55.81	1.01	0.45
Moisture	1	59.69	59.69	19.59	0.0005
Site x Moisture	4	87.33	21.83	7.16	0.002
Agropyron trachycaulum:					
Site	4	502.44	125.61	6.64	0.007
Moisture	1	234.32	234.32	21.77	0.0003
Site x Moisture	4	330.26	82.56	7.67	0.0014
Bromus inermis:					
Site	4	147.10	36.78	0.90	0.50
Moisture	1	74.55	74.55	9.17	0.009
Site x Moisture	4	53.62	13.40	1.65	0.21
Festuca hallii:					
Site	4	2742.78	685.69	8.69	0.003
Moisture	1	895.66	895.66	23.67	0.0002
Site x Moisture	4	156.25	39.06	1.03	0.42
Stipa comata:					
Site	4	938.27	234.57	28.20	0.0001
Moisture	1	1.81	1.81	14.38	0.0018
Site x Moisture	4	5.38	1.35	10.72	0.0003
Stipa curtiseta:					
Site	4	285.73	71.43	2.67	0.09
Moisture	1	0.02	0.02	0.03	0.87
Site x Moisture	4	2.88	0.72	0.82	0.53
Stipa viridula:					
Site	4	48.90	12.23	1.85	0.20
Moisture	1	1.39	1.39	12.21	0.003
Site x Moisture	4	1.10	0.28	2.43	0.09
Stipa viridula (Lodorm):					
Site	4	787.27	196.82	6.72	0.007
Moisture	1	0.36	0.36	0.17	0.68
Site x Moisture	4	15.66	3.91	1.88	0.17

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[*] See Methods for details and section 2.4.7 for analysis methods.

2.5.5.2. Cohort and Comparative Survivorship

Survivorship of the 1989 germination cohorts was excellent during the first year, except for *Festuca hallii*. This was not true for most of the germinants in the second year (1990), which had a very dry May (Fig. II-17). Survivorship was affected by the timing of germination, as indicated by the significantly greater survival of the early germinants (first two germination cohorts) compared to the later (subsequent cohorts of 1989) in three species (*Agropyron trachycaulum*, *Festuca hallii*, and *Stipa curtiseta*) (Table II-7). The comparative survivorship over two years of the early and late 1989 germinants was significantly influenced by position along the topographic gradient in more than half of the grasses studied (Table II-7). When the second year germination cohorts were included in the comparative survivorship analysis, *Stipa viridula* also exhibited a site effect (Table II-8). The weekly irrigation treatment caused a significant increase in the comparative survivorship of the first year germination cohorts for all four soft-seeded species (Table II-7). LSM comparisons revealed that comparative survivorship was not significantly affected at all sites and was not identical between the moisture treatments (Table II-9).

2.5.5.3. Survivorship of 1990 Germinants

There was much more variation in the survivorship of the needle grass germinants between moisture treatments and along the topographic gradient in 1990 than in 1989 (Fig. II-18 compared with Fig. II-16b). A significant difference in survivorship among the five sites was obtained for all three species (Table II-10). A significant treatment effect for the entire gradient was found in *Stipa comata* (ANCOVA, $p=0.033$). A test of the ratio of mortalities to survivors revealed significant differences in the survivorship within the mid-slope positions in *Stipa curtiseta* and *S. viridula* due to the previous year's irrigation treatment (Fig. II-18).

2.5.5.4. 1990 Survival of 1989 Germinants

Almost all seedlings of the seven taxa that were alive at the end of the 1989 field season, in all treatments and sites, survived to the end of the second field season despite a dry early summer; the exception was *Festuca hallii* (Fig. II-19). In some cases survivorship exceeded 100% because individuals thought to have succumbed in 1989 had senesced and were dormant, not dead, at the end of the first field season. Survivorship of 1989 germinants of *Agropyron trachycaulum, Festuca hallii, Stipa comata*, and *S. viridula* (Lodorm) was significantly affected by topographic position in both 1989 and 1990 (compare Table II-6 with II-11). There was little significant effect on second year survivorship from the previous year's irrigation treatment (Table II-11 and LSM, Fig. II-19).

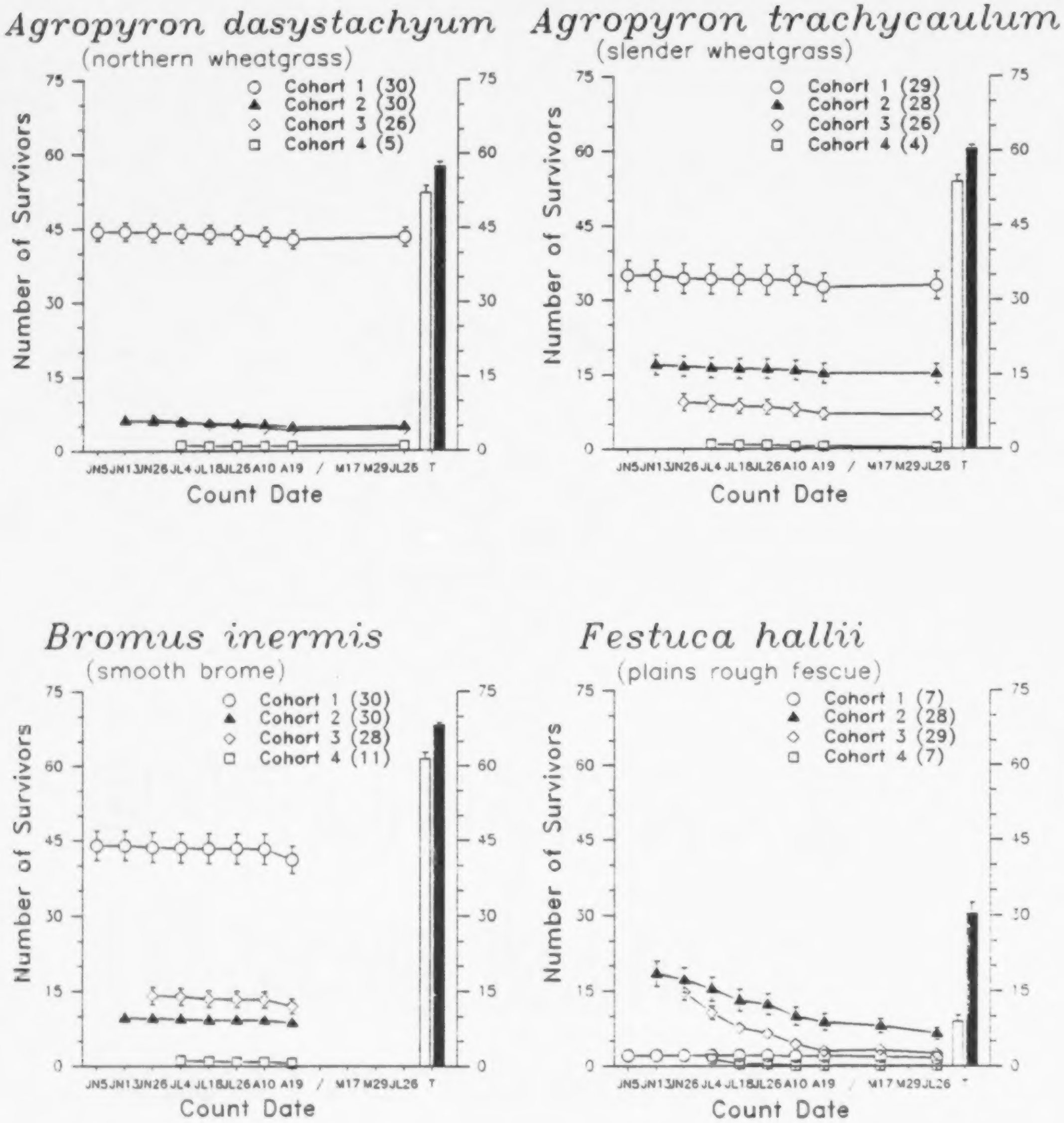


Fig. II−17a. Mean (n in brackets) and S.E.M. of the number of germinants in the illustrated cohorts surviving at each subsequent count date in 1989/1990 within the control moisture treatment only from all five topographic gradient locations. Bars represent the mean (n=30) and S.E.M. of the total number of survivors at the end of the second year for unirrigated (□) and irrigated (■) moisture treatments. Months are M=May, JN=June, JL=July, A=August, and S=September. (Means and standard errors in Appendix 5−Table 12).

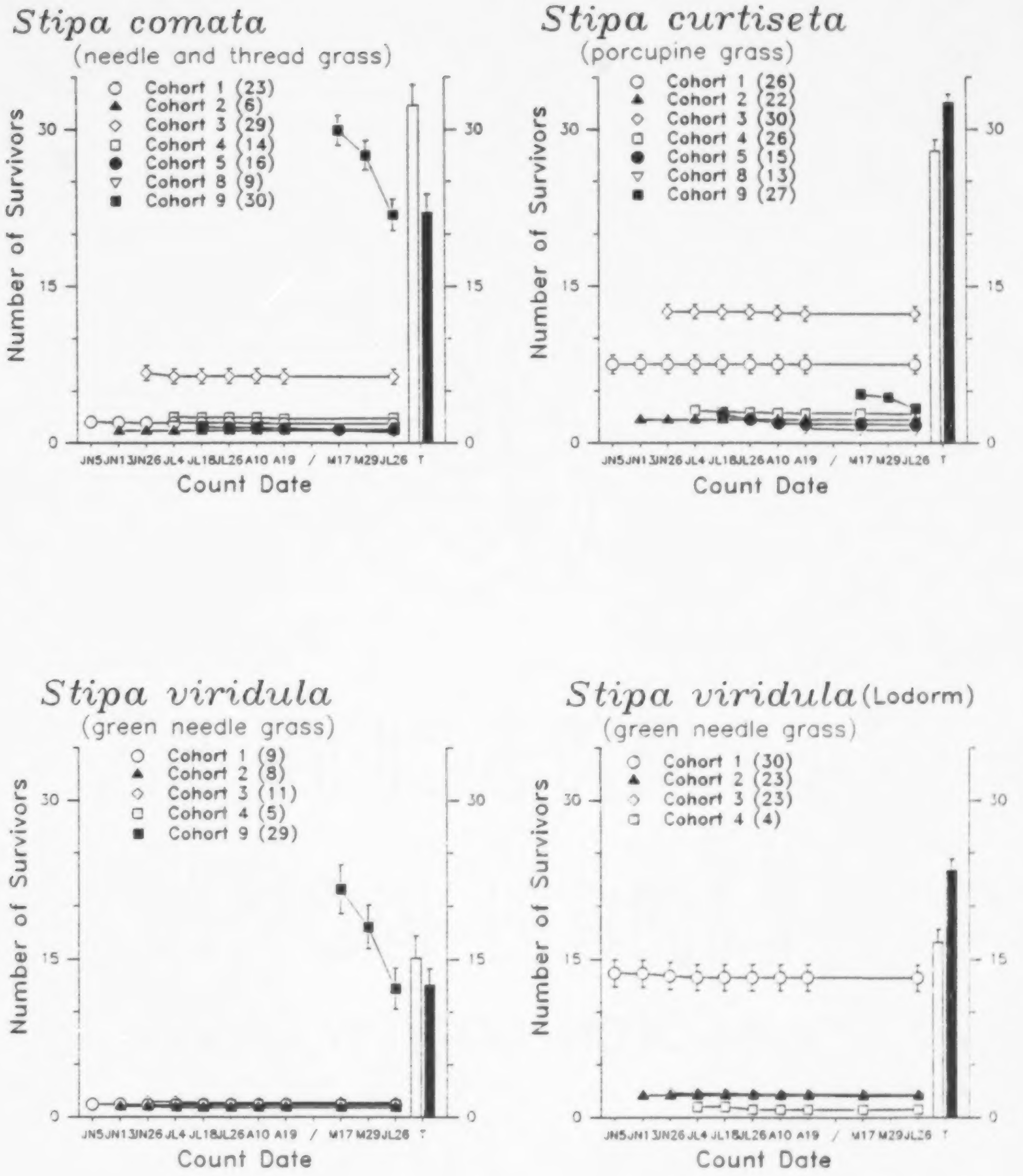


Fig. II-17b. Same as Fig. II-17a. (Means and standard errors in Appendix 5-Table 12).

Table II-7. Summary of ANCOVA results for comparative survivorship at the end of 1990 field season between early germinants (first 2 cohorts) and all later germinants in 1989 (subsequent 6 cohorts).* *Bromus inermis* results for 1989 only. Number of germinants used as covariate for two groups.

	Source of Variation					
Species	Site(S)	Moisture Treatment(T)	S x T	Group(G)	T x G	S x G
Agropyron dasystachyum	**0.007**	**0.015**	0.14	0.76	0.78	0.66
Agropyron trachycaulum	**0.0004**	**0.0001**	**0.009**	**0.02**	0.055	0.54
Bromus inermis	0.13	**0.0001**	0.08	0.058	**0.03**	0.23
Festuca hallii	**0.02**	**0.0004**	0.61	**0.02**	0.15	0.19
Stipa comata	**0.0001**	0.74	0.13	0.73	0.68	0.31
Stipa curtiseta	0.40	0.82	0.23	**0.001**	**0.05**	**0.05**
Stipa viridula	0.22	0.38	0.90	0.93	0.40	0.78
Stipa viridula (Lodorm)	**0.007**	0.72	0.61	0.22	0.48	0.87

* See Methods for details and section 2.4.7 for analysis methods.

Table II-8. Summary of ANCOVA results for comparative survivorship of *Stipa* sp. at the end of the 1990 field season between early germinants (first 2 cohorts) and all later germinants during 1989 and 1990 (subsequent 9 cohorts).[1] Number of germinants used as covariate for two groups. Least-squares means comparisons made for group effect with moisture treatments at sites along the topographic gradient (A = ridgetop).

	Source of Variation					
Species	Site(S)	Moisture Treatment(T)	S x T	Group(G)	T x G	S x G
Stipa comata	**0.0001**	**0.009**	0.09	0.88	**0.02**	0.13
Stipa curtiseta	0.19	0.89	0.48	**0.0001**	0.32	0.19
Stipa viridula	**0.004**	0.53	0.20	0.52	0.89	0.07

		Site				
Species	Source[2]	A	B	C	D	E
Stipa comata	C-G	ns	ns	ns	ns	**0.05**
	I-G	**0.04**	ns	ns	**0.04**	ns
Stipa curtiseta	C-G	ns	**0.003**	**0.01**	**0.003**	**0.009**
	I-G	ns	**0.005**	ns	ns	**0.03**
Stipa viridula	C-G	ns	ns	ns	**0.01**	ns
	I-G	ns	ns	ns	ns	ns

---

[1] See Methods for details and section 2.4.7 for analysis methods.

[2] C-G = group effect in control moisture treatment,
I-G = group effect in first year (1989) irrigation moisture treatment
ns = not significant

Table II-9. Summary of ANCOVA results for comparative survivorship at the end of 1990 field season between early germinants (first 2 cohorts) and all later germinants in 1989 (subsequent 6 cohorts).[1] Least-squares means comparisons between moisture treatments (control and irrigated) at five sites along the topographic gradient (A = ridgetop). *Bromus inermis* results for 1989 only. Number of germinants were used as the covariate.

		Site				
Species	Source[2]	A	B	C	D	E
Agropyron dasystachyum	C-G	ns	ns	ns	ns	ns
	I-G	ns	ns	ns	ns	ns
Agropyron trachycaulum	C-G	0.002	ns	0.0002	0.0006	0.0014
	I-G	0.003	0.0008	0.011	0.0013	0.0003
Bromus inermis	C-G	ns	ns	ns	0.04	ns
	I-G	ns	(0.051)	ns	ns	(0.059)
Festuca hallii	C-G	ns	ns	ns	ns	ns
	I-G	ns	ns	ns	0.03	0.003
Stipa comata	C-G	ns	ns	ns	ns	ns
	I-G	ns	ns	ns	ns	ns
Stipa curtiseta	C-G	ns	0.02	0.0002	ns	0.02
	I-G	ns	ns	ns	ns	ns
Stipa viridula	C-G	ns	ns	ns	ns	ns
	I-G	ns	ns	ns	ns	ns
Stipa viridula (Lodorm)	C-G	ns	ns	ns	ns	ns
	I-G	ns	ns	ns	ns	ns

[1] See Methods for details and section 2.4.7 for analysis methods.

[2] C-G = group effect in control moisture treatment,
I-G = group effect in first year (1989) irrigation moisture treatment
ns = not significant

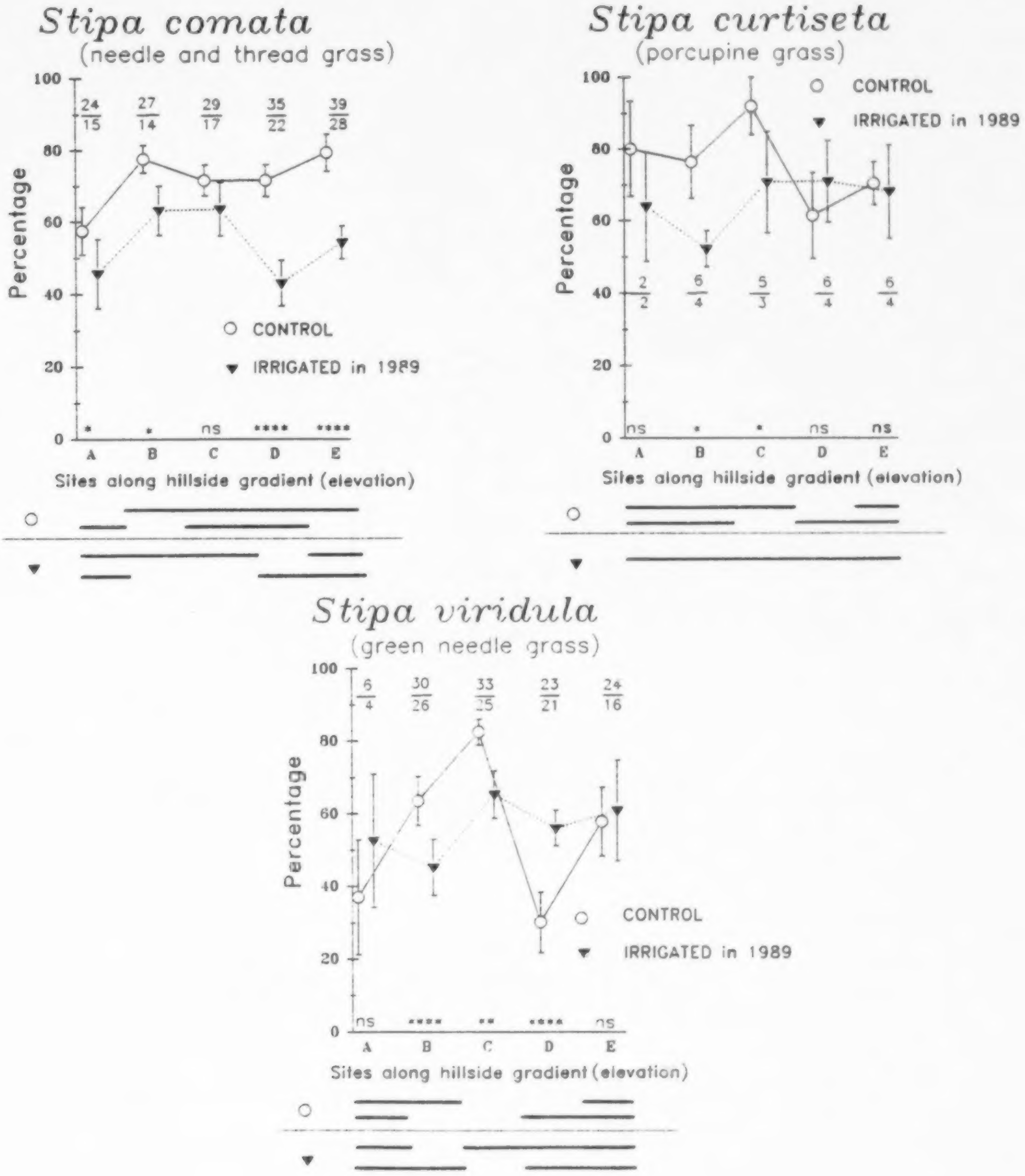


Fig. II–18. Mean (n=6) and S.E.M. of total 1990 survivorship (percentage of the number of 1990 germinants) at the end of the 1990 field season (30 July) within the control and previously irrigated moisture treatments at locations along the topographic gradient. Significance levels for difference between moisture treatments at each gradient location are listed on the x–axis (ns=not significant, *=⩽0.05, **=⩽0.01, ***=⩽0.001, ****=⩽0.0001). Numbers represent mean number of germinants during 1990 in control (top) and irrigated (bottom) moisture treatments. Lines connect means which are not significantly different (least–squares means comparison). (Means and standard errors in Appendix 5–Table 13).

Table II-10. Summary of ANCOVA results for the survivorship of the 1990 germinants at the end of the field season.* Number of germinants used as the covariate.

Source	DF	SS	MS	F	Pr>F
Stipa comata:					
Site	4	1097.60	274.40	18.69	**0.0001**
Moisture	1	61.0	61.0	5.48	**0.033**
Site x Moisture	4	111.56	27.89	2.51	0.09
Stipa curtiseta:					
Site	4	32.57	8.14	3.51	**0.05**
Moisture	1	3.96	3.96	3.17	0.1
Site x Moisture	4	7.67	1.92	1.54	0.24
Stipa viridula:					
Site	4	2518.07	629.52	8.88	**0.003**
Moisture	1	21.59	21.59	1.16	0.30
Site x Moisture	4	316.57	79.14	4.24	**0.02**

* See Methods for details and section 2.4.7 for analysis methods.

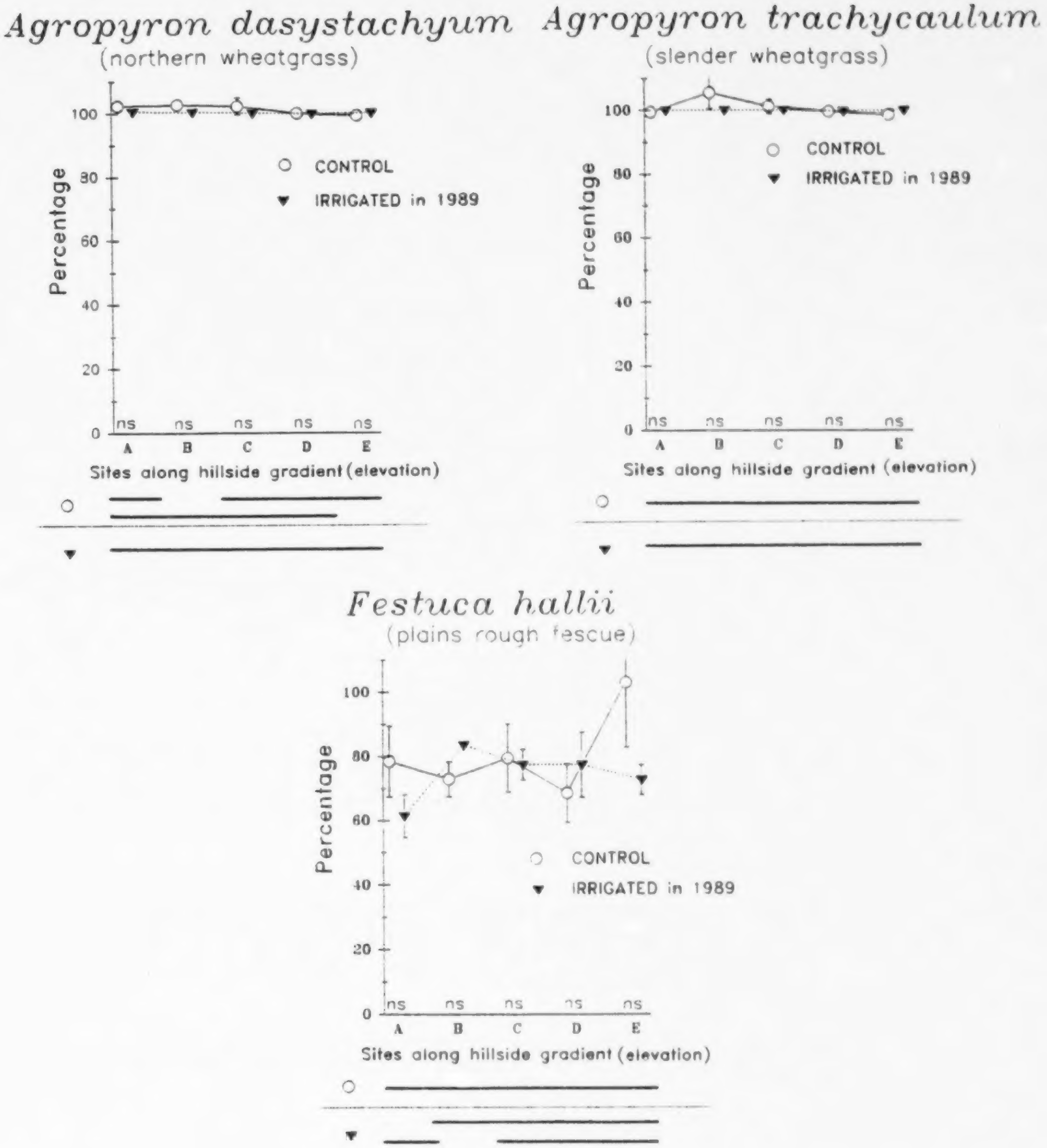
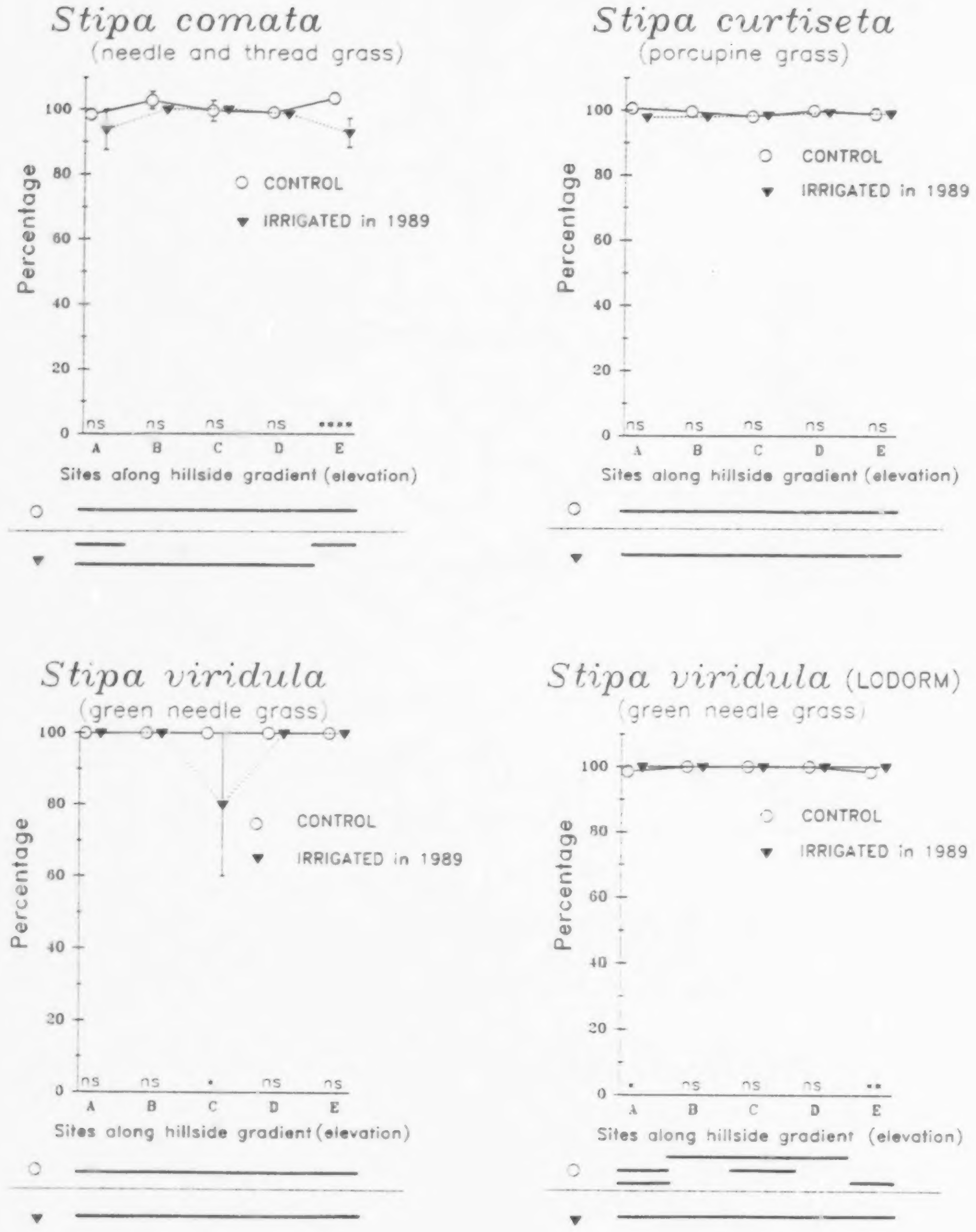


Fig. II−19a. Mean (n=6) and S.E.M. of total survivorship of 1989 survivors (3 Sept.) at the end of the 1990 field season (30 July) within the control and previously irrigated moisture treatments at locations along the topographic gradient. Significance levels for difference between moisture treatments at each gradient location are listed on the x−axis (ns=not significant, *=≤0.05, **=≤0.01, ***=≤0.001, ****=≤0.0001). Lines connect means which are not significantly different (least−squares means comparison). (Means and standard errors in Appendix 5−Table 14).



Stipa comata (needle and thread grass)

Stipa curtiseta (porcupine grass)

Stipa viridula (green needle grass)

Stipa viridula (LODORM) (green needle grass)

Fig. II–19b. Same as Fig. II–19a. (Means and standard errors in Appendix 5–Table 14).

Table II-11. Summary of ANCOVA results for 1990 survivorship of individuals surviving at the end of the 1989 field season.* The number of survivors at the end of the 1989 field season were the covariate.

Source	DF	SS	MS	F	Pr>F
Agropyron dasystachyum:					
Site	4	165.40	41.35	0.82	0.54
Moisture	1	2.85	2.85	1.86	0.19
Site x Moisture	4	4.83	1.21	0.79	0.55
Agropyron trachycaulum:					
Site	4	366.06	91.51	6.12	**0.009**
Moisture	1	4.87	4.87	1.92	0.19
Site x Moisture	4	9.38	2.34	0.92	0.48
Festuca hallii:					
Site	4	1688.07	422.02	9.86	**0.002**
Moisture	1	8.29	8.29	0.33	0.58
Site x Moisture	4	119.64	29.91	1.17	0.36
Stipa comata:					
Site	4	903.0	225.75	21.64	**0.0001**
Moisture	1	3.39	3.39	3.97	0.06
Site x Moisture	4	7.44	1.86	2.18	0.12
Stipa curtiseta:					
Site	4	257.73	64.43	2.54	0.11
Moisture	1	0.59	0.59	1.85	0.19
Site x Moisture	4	1.37	0.34	1.07	0.40
Stipa viridula:					
Site	4	50.0	12.5	1.83	0.20
Moisture	1	0.02	0.02	1.08	0.32
Site x Moisture	4	0.07	0.02	1.03	0.43
Stipa viridula (Lodorm):					
Site	4	792.9	198.23	6.67	**0.007**
Moisture	1	0.61	0.61	6.56	**0.02**
Site x Moisture	4	0.71	0.18	1.93	0.16

* See Methods for details and section 2.4.7 for analysis methods.

2.5.5.5. Total Survivorship

The percentage of all germinants surviving to the end of the second field season was quite high for all species. The exceptions were *Festuca hallii*, which sustained substantial mortality in both years, and *Stipa comata* and *S. viridula*, in which there was considerable mortality of the second year germinants (Fig. II-20).

Topographic position significantly influenced the survivorship of all species except *Agropyron dasystachyum* and *Stipa curtiseta* (Table II-12). The total survivorship of *Agropyron dasystachyum, A. trachycaulum, Festuca hallii*, and *Stipa comata* was significantly affected by the first year irrigation treatment in both the first and second year (Table II-12 compared with Table II-6). This effect was significantly only in the first year for *Stipa viridula*. A test of the ratio of survivors to number of mortalities indicated that effects from the one year irrigation treatment were not significant at all sites (Fig. II-20).

The total number of individuals surviving after two years was a function of species-specific germination and survivorship rates (Fig. II-21).

2.5.6. Morphometrics

2.5.6.1. 1989 Biomass

Biomass production for most species increased downslope to a maximum at site D which had higher moisture and nutrient availability. Generally, productivity was lower in the drier upper slope and the alkaline lowland. In contrast, *Stipa viridula*, which prefers high clay and silt soils, achieved maximum above-ground productivity in the mid-slope position (Fig. II-22). The topographic gradient had a significant influence on *Agropyron dasystachyum, Bromus inermis*, and *Stipa curtiseta* (Table II-13). The irrigation treatment significantly increased biomass production, mainly within the soft-seeded species (Table II-13). For most species, the effect of irrigation was greatest at the upper slope and lowland sites (LSM, Fig. II-22).

2.5.6.2. 1990 Biomass

Biomass production in the second year exhibited trends similar to those of the first year (e.g. much lower production in the alkaline lowland) (Table II-14). Consistent trends separating the moisture treatments along the topographic gradient were not always obtained, particularly among the needle grasses (Fig. II-23). There was little difference between the control and 1989 irrigated treatment plots, except for *Agropyron trachycaulum* (ANCOVA, $p=0.042$) where the control biomass increased significantly along the lower slope. A LSM comparison revealed isolated significant effects from the previous year's irrigation treatment at some sites (LSM, Fig. II-23). Examples of growth are illustrated in Plates II-1 and II-2.

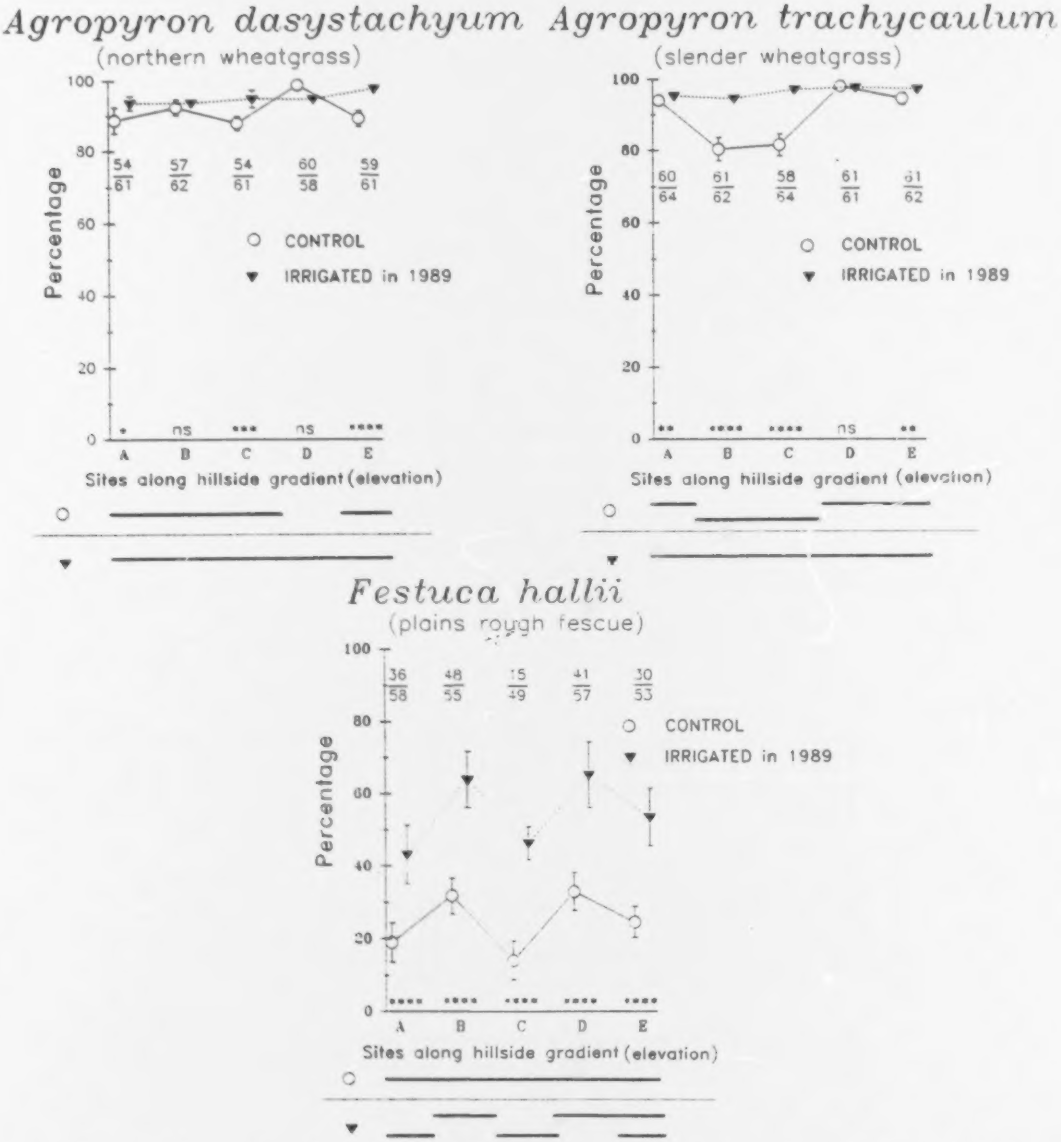


Fig. II–20a. Mean (n=6) and S.E.M. of total survivorship (percentage of total number of germinants) at the end of the second field season (30 July 1990) under control and first year irrigation moisture treatments at locations along the topographic gradient. Significance levels for difference between moisture treatments at each gradient location are listed on the x–axis (ns=not significant, *=≤0.05, **=≤0.01, ***=≤0.001, ****=≤0.0001). Numbers represent mean number of germinants during 1989 and 1990 in control (top) and first year irrigation (bottom) moisture treatments. Lines connect means which are not significantly different (least–squares means comparison). (Means and standard errors in Appendix 5–Table 15).

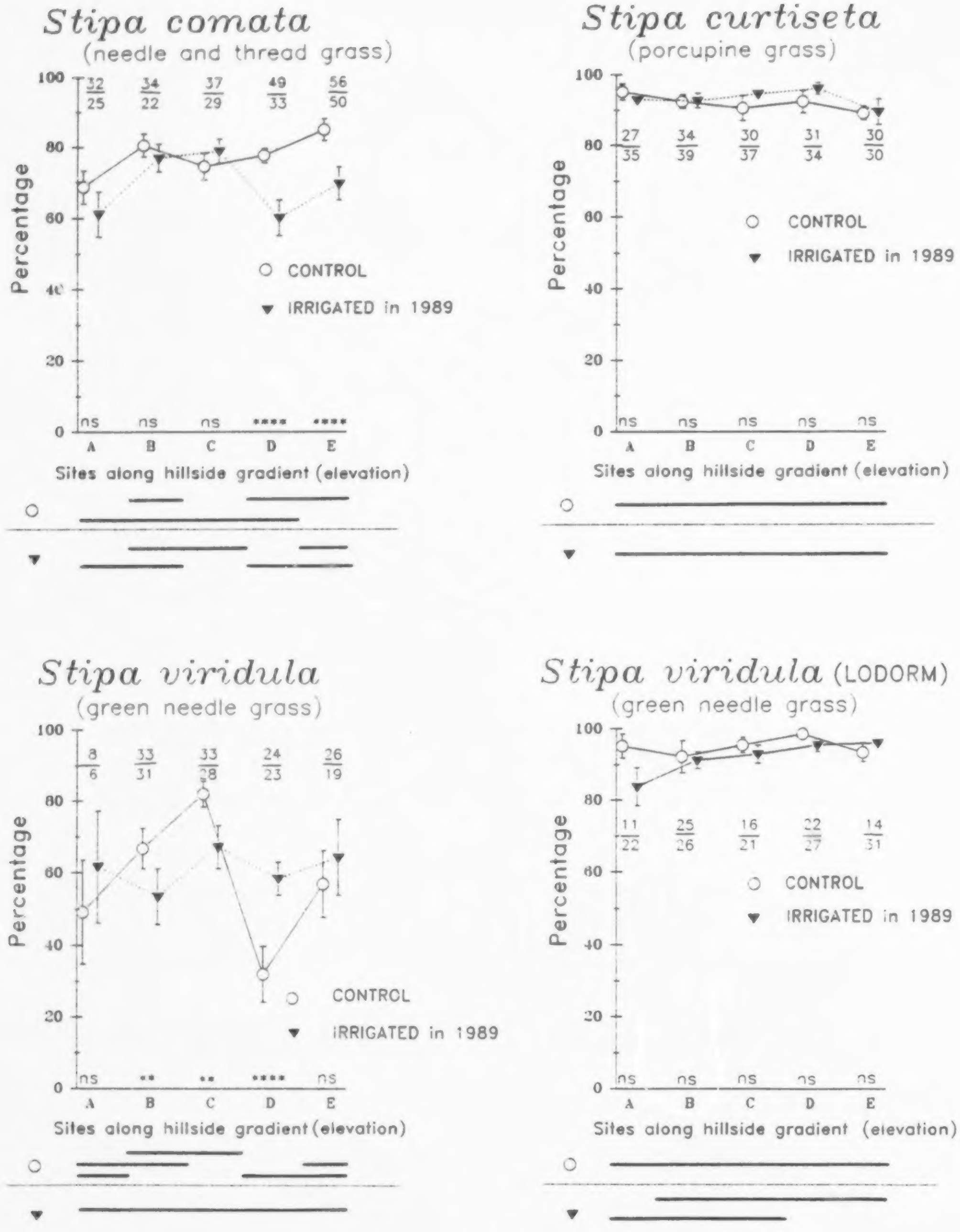


Fig. II–20b. Same as Fig. II–20a. (Means and standard errors in Appendix 5–Table 15).

Table II-12. Summary of ANCOVA results for total survivorship over the two year period.* Total germination was the covariate.

Source	DF	SS	MS	F	Pr>F
Agropyron dasystachyum:					
Site	4	165.40	41.35	0.82	0.54
Moisture	1	28.20	28.20	6.13	0.03
Site x Moisture	4	84.48	21.12	4.59	0.013
Agropyron trachycaulum:					
Site	4	366.06	91.51	6.12	0.009
Moisture	1	201.29	201.29	33.64	0.0001
Site x Moisture	4	229.42	57.35	9.59	0.0005
Festuca hallii:					
Site	4	1688.07	422.02	9.86	0.002
Moisture	1	822.48	822.48	12.02	0.004
Site x Moisture	4	125.56	31.39	0.46	0.76
Stipa comata:					
Site	4	3743.77	935.94	28.87	0.0001
Moisture	1	87.19	87.19	5.81	0.03
Site x Moisture	4	167.47	41.87	2.79	0.06
Stipa curtiseta:					
Site	4	280.50	70.13	3.17	0.06
Moisture	1	0.05	0.05	0.01	0.91
Site x Moisture	4	10.46	2.61	0.74	0.58
Stipa viridula:					
Site	4	2657.23	664.31	7.63	0.004
Moisture	1	4.88	4.88	0.26	0.62
Site x Moisture	4	282.02	70.50	3.77	0.03
Stipa viridula (Lodorm):					
Site	4	792.9	198.23	6.67	0.007
Moisture	1	0.04	0.04	0.02	0.90
Site x Moisture	4	18.38	4.59	2.04	0.14

* See Methods for details and section 2.4.7 for analysis methods.

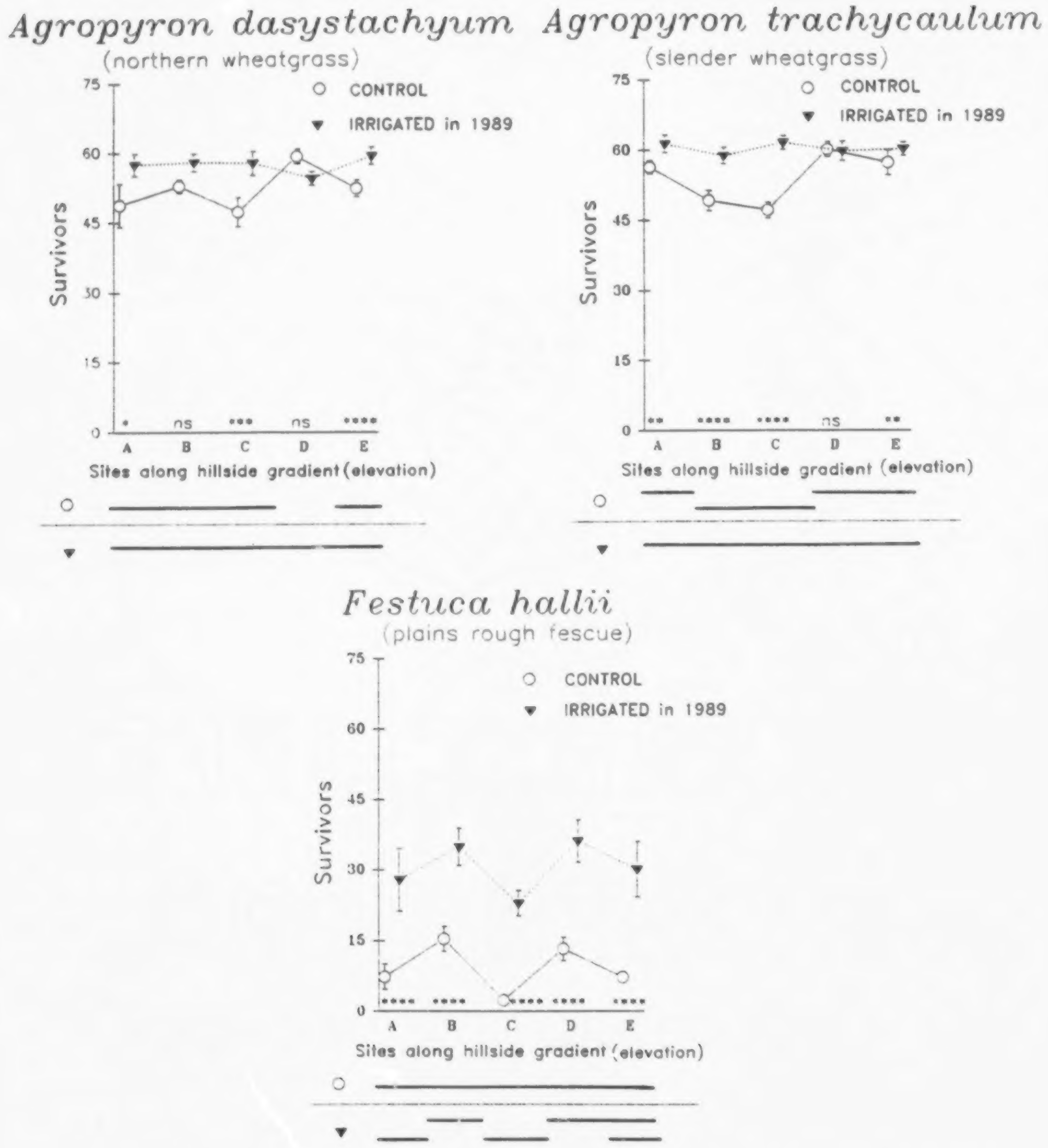


Fig. II–21a. Mean (n=6) and S.E.M. of the total number of individuals surviving at the end of the second field season (30 July 1990) under control and first year irrigation moisture treatments at locations along the topographic gradient. Significance levels for difference between moisture treatments at each gradient location are listed on the x–axis (ns=not significant, *=$\leqslant$0.05, **=$\leqslant$0.01, ***=$\leqslant$0.001, ****=$\leqslant$0.0001). Lines connect means which are not significantly different (least–squares means comparison). (Means and standard errors in Appendix 5–Table 16).

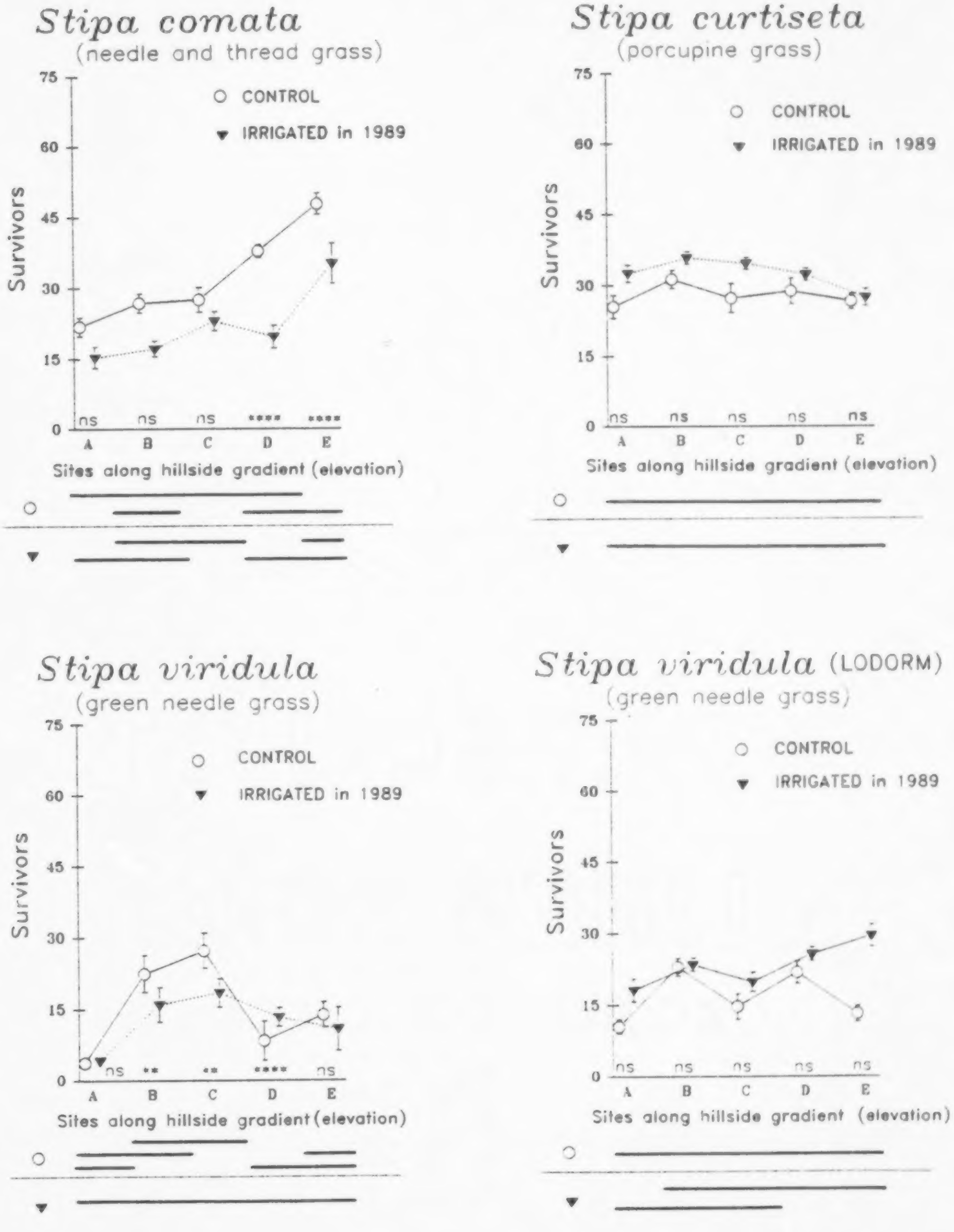


Fig. II–21b. Same as Fig. II–21a. (Means and standard errors in Appendix 5–Table 16).

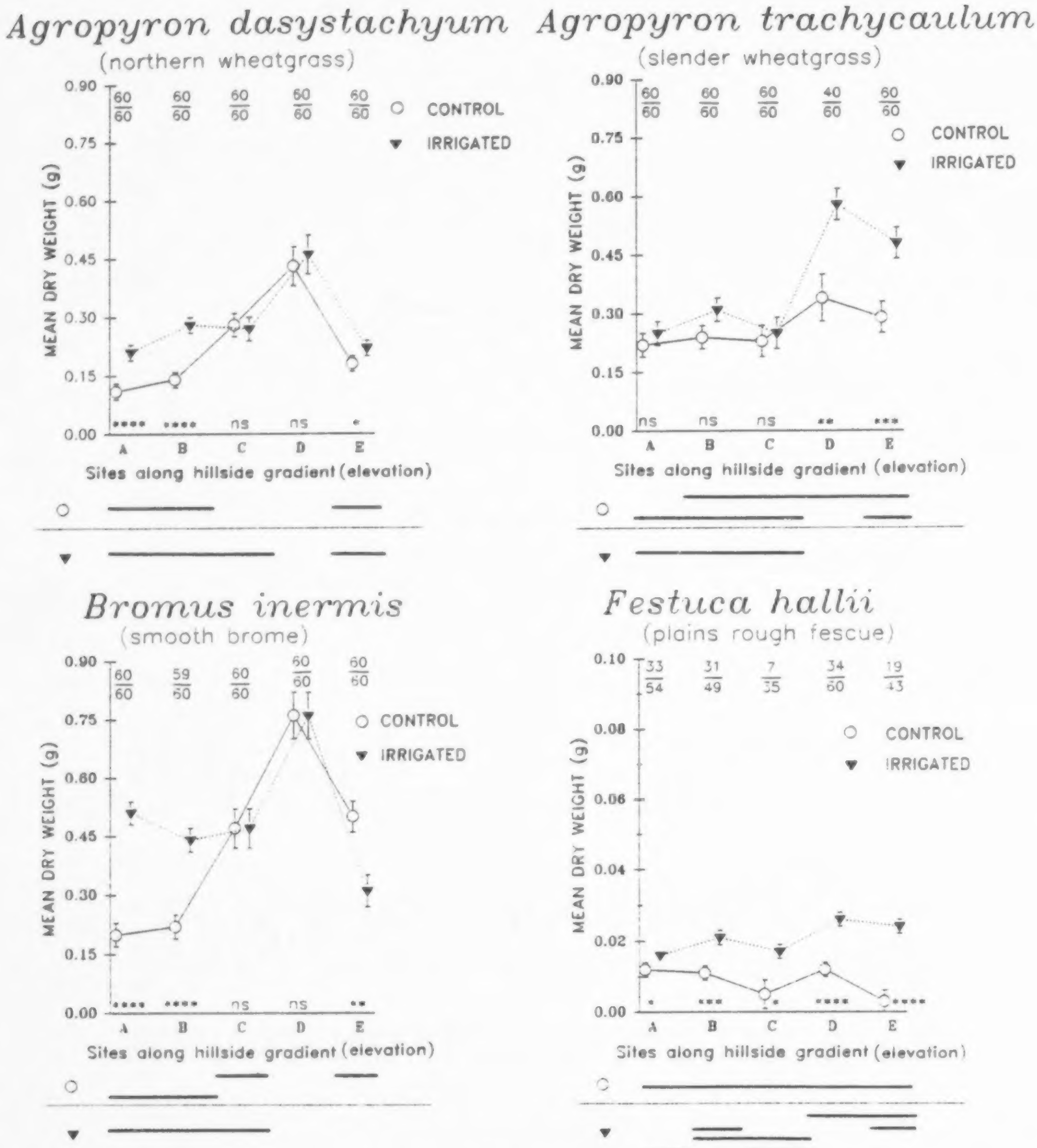


Fig. II−22a. Least−squares mean (LSM) and S.E.M. of individual above−ground biomass at the end of the first growing season (1989) within control and irrigated moisture treatments at locations along the topographic gradient. Significance levels for difference between moisture treatments at each gradient location are listed on the x−axis (ns=not significant, *=≤0.05, **=≤0.01, ***=≤0.001, ****=≤0.0001). Lines connect means which are not significantly different (least−squares means comparison). Numbers are sample sizes of means for control (above) and irrigation (below) treatments. (Means and standard errors in Appendix 5−Table 17).

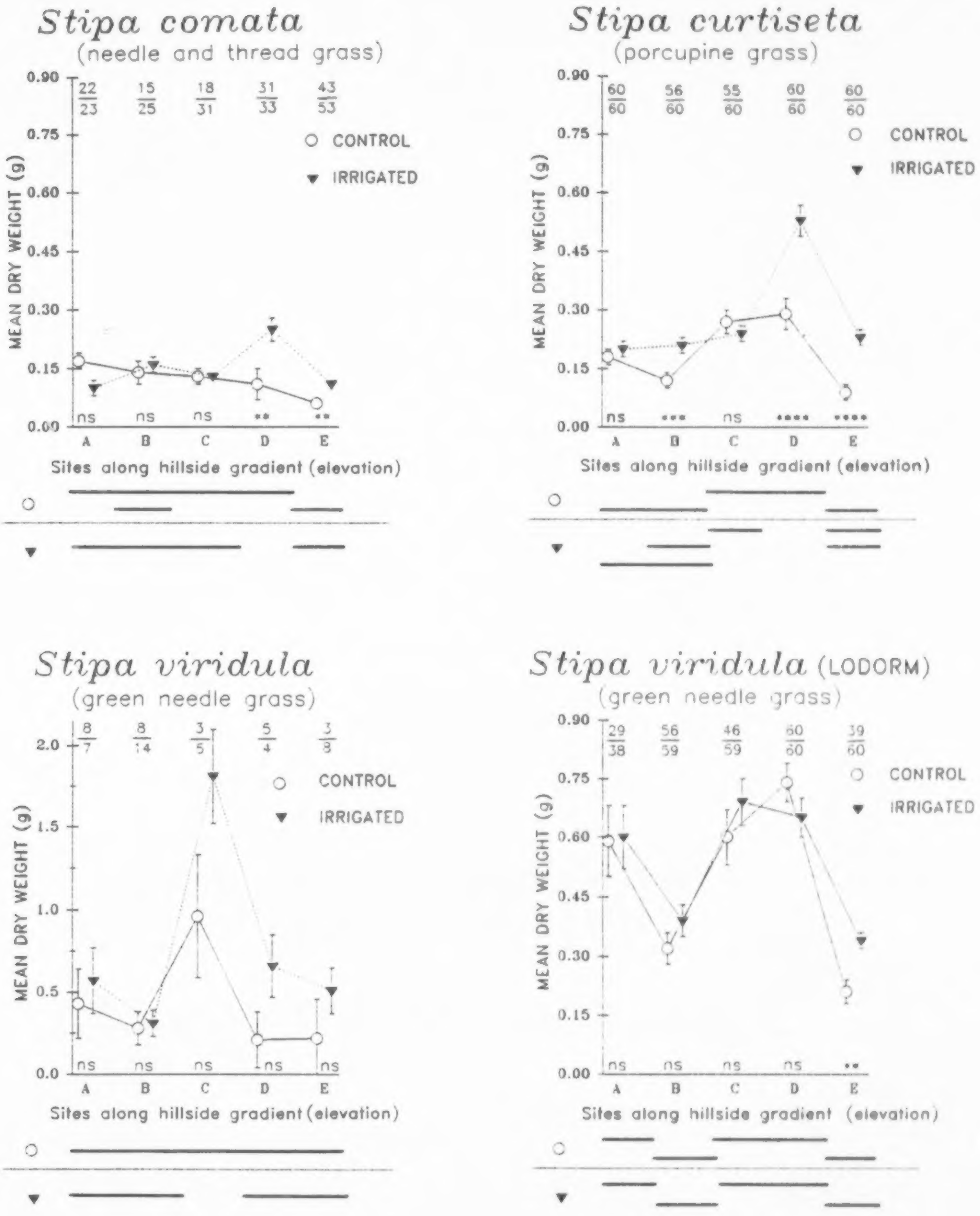


Fig. II–22b. Same as Fig. II–22a. (Means and standard errors in Appendix 5–Table 17).

Table II-13. Summary of ANCOVA results for above-ground biomass production in 1989.[*] Absolute germination cohort date was used for the covariate.

Source	DF	SS	F	Pr>F
Agropyron dasystachyum:				
Site	4	5.90	5.15	0.016
Moisture	1	0.55	1.92	0.20
Site x Moisture	4	0.42	0.36	0.83
Agropyron trachycaulum:				
Site	4	3.33	3.23	0.06
Moisture	1	1.36	5.28	0.05
Site x Moisture	4	0.87	0.85	0.53
Bromus inermis:				
Site	4	14.73	31.70	0.0001
Moisture	1	0.62	5.31	0.04
Site x Moisture	4	4.74	10.19	0.002
Festuca hallii:				
Site	4	0.001	0.40	0.81
Moisture	1	0.006	7.71	0.02
Site x Moisture	4	0.0009	0.32	0.86
Stipa comata:				
Site	4	0.65	2.37	0.12
Moisture	1	0.02	0.34	0.57
Site x Moisture	4	0.40	1.48	0.28
Stipa curtiseta:				
Site	4	5.64	14.15	0.0004
Moisture	1	0.69	6.95	0.025
Site x Moisture	4	1.01	2.52	0.12
Stipa viridula:				
Site	4	2.78	2.92	0.08
Moisture	1	0.55	2.30	0.16
Site x Moisture	4	0.66	0.69	0.62
Stipa viridula (Lodorm):				
Site	4	12.26	2.79	0.09
Moisture	1	0.24	0.21	0.65
Site x Moisture	4	0.68	0.16	0.96

[*] See Methods for details and section 2.4.7 for analysis methods.

Table II-14. Summary of ANCOVA results for above-ground biomass production in 1990.* Absolute germination cohort date was the covariate.

Source	DF	SS	F	Pr>F
Agropyron dasystachyum:				
Site	4	58.37	6.34	**0.008**
Moisture	1	7.38	3.21	0.10
Site x Moisture	4	22.27	2.42	0.12
Agropyron trachycaulum:				
Site	4	188.38	2.76	0.09
Moisture	1	92.29	5.42	**0.04**
Site x Moisture	4	32.21	0.47	0.76
Festuca hallii:				
Site	4	0.56	0.63	0.65
Moisture	1	0.06	0.27	0.61
Site x Moisture	4	0.08	0.09	0.98
Stipa comata:				
Site	4	78.23	4.54	**0.02**
Moisture	1	0.52	0.12	0.74
Site x Moisture	4	9.45	0.55	0.70
Stipa curtiseta:				
Site	4	200.02	5.64	**0.01**
Moisture	1	0.05	0.01	0.94
Site x Moisture	4	108.44	3.06	0.07
Stipa viridula:				
Site	4	26.54	1.64	0.25
Moisture	1	6.58	1.63	0.23
Site x Moisture	4	29.18	1.81	0.21
Stipa viridula (Lodorm):				
Site	4	395.68	6.00	**0.01**
Moisture	1	7.76	0.47	0.51
Site x Moisture	4	28.90	0.44	0.78

* See Methods for details and section 2.4.7 for analysis methods.

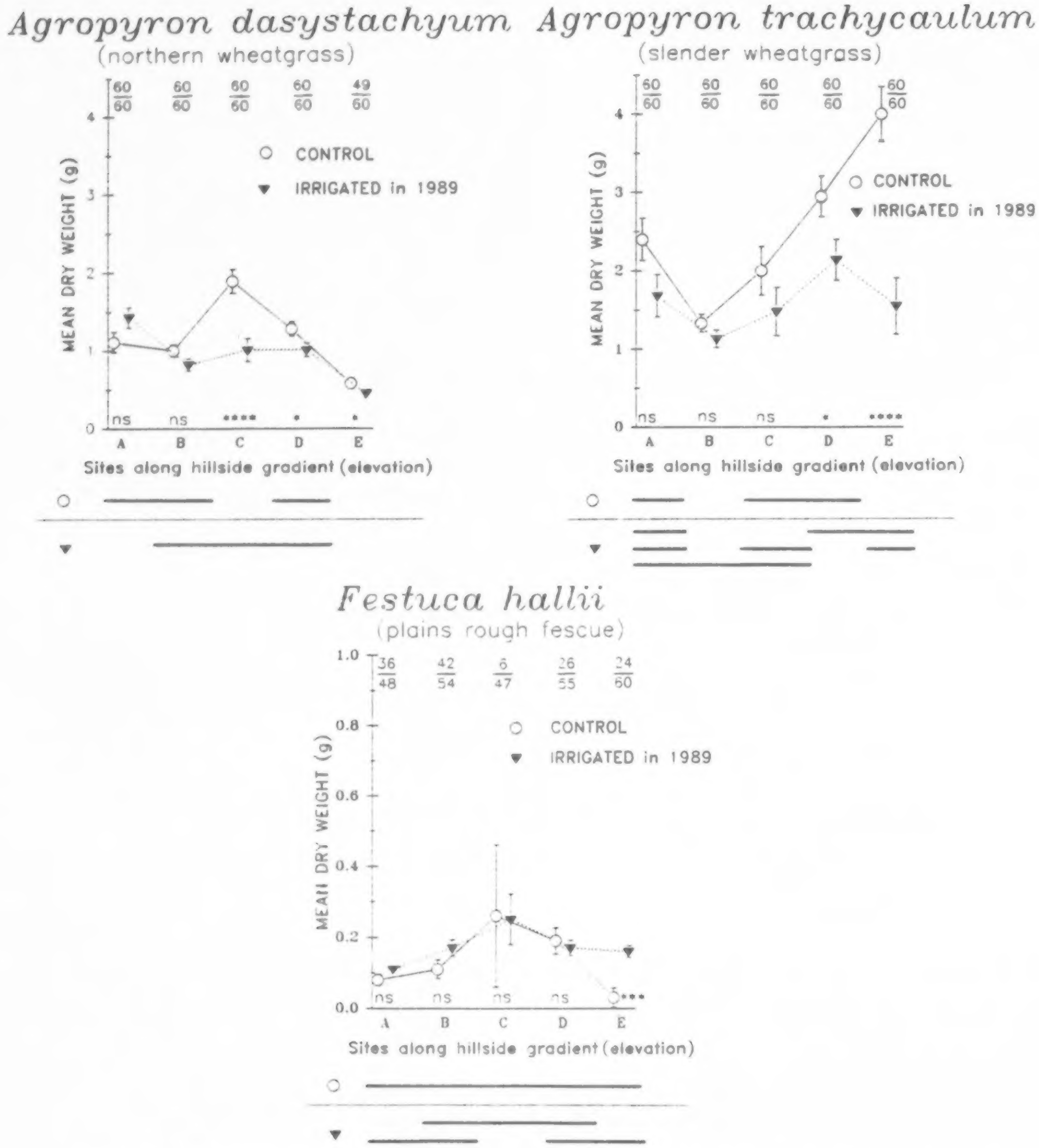
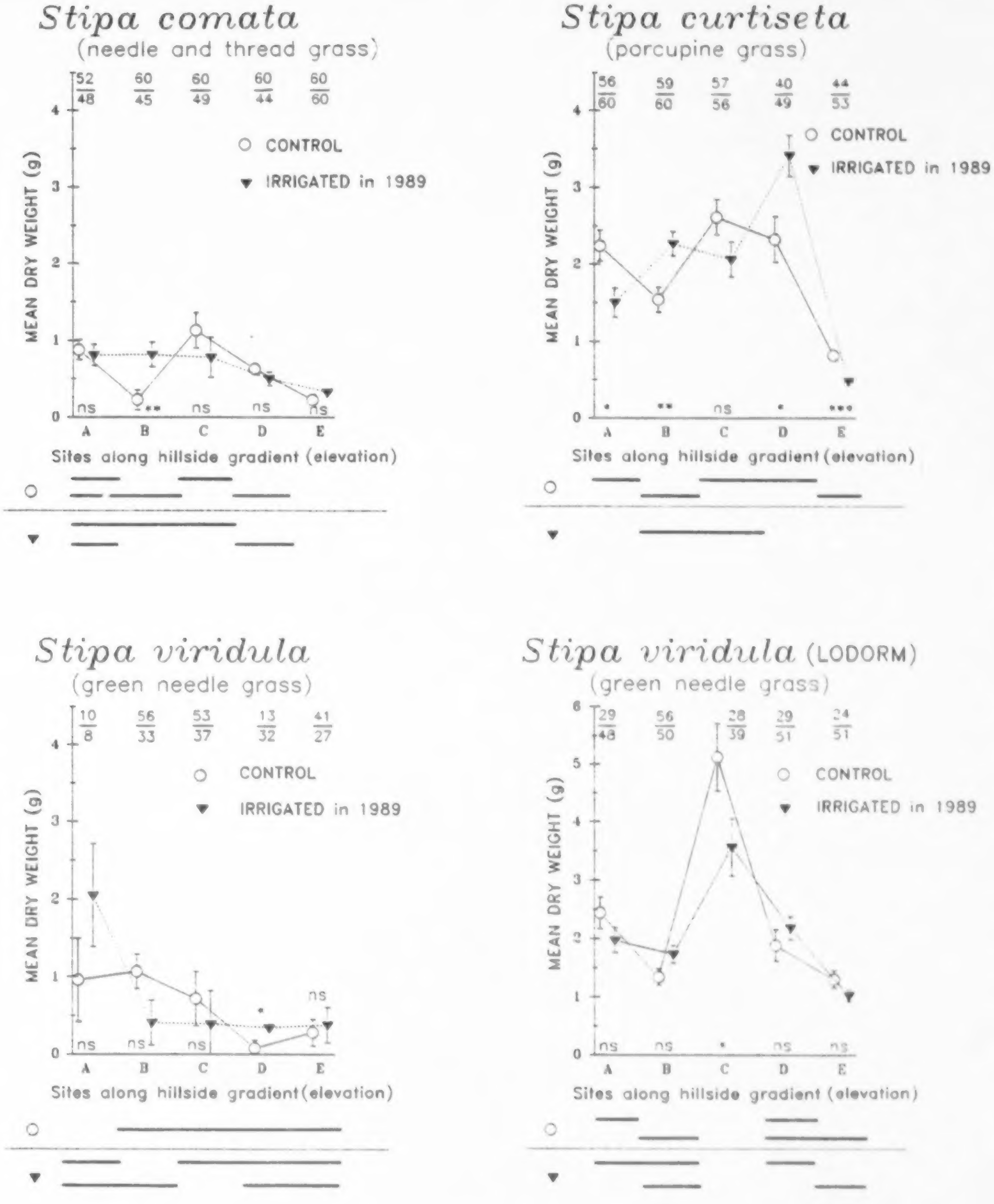


Fig. II–23a. Least–squares mean (LSM) and S.E.M. of individual above–ground biomass at the end of the second growing season (1990) within control and previously irrigated moisture treatments at locations along the topographic gradient. Significance levels for difference between moisture treatments at each gradient location are listed on the x–axis (ns=not significant, *=⩽0.05, **=⩽0.01, ***=⩽0.001, ****=⩽0.0001). Lines connect means which are not significantly different (least–squares means comparison). Numbers are sample sizes of means for control (above) and previous irrigation (below) treatments. (Means and standard errors in Appendix 5–Table 18).



Stipa comata
(needle and thread grass)

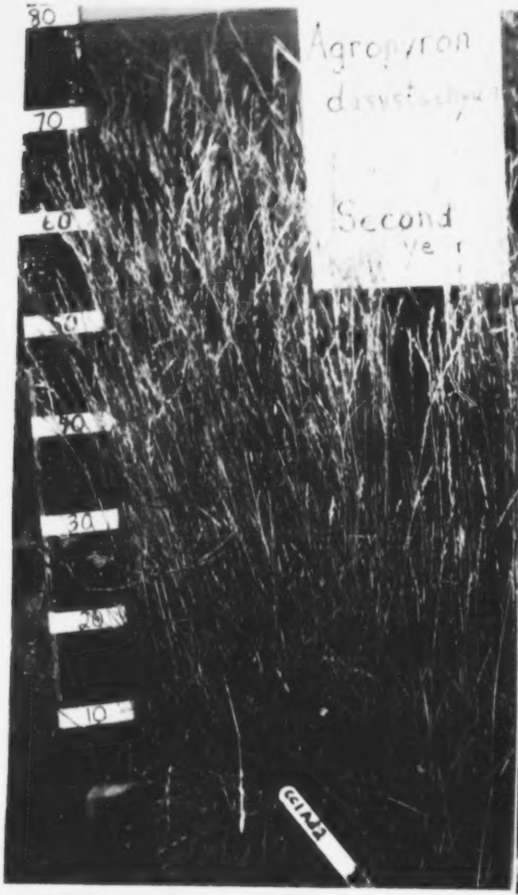
Stipa curtiseta
(porcupine grass)

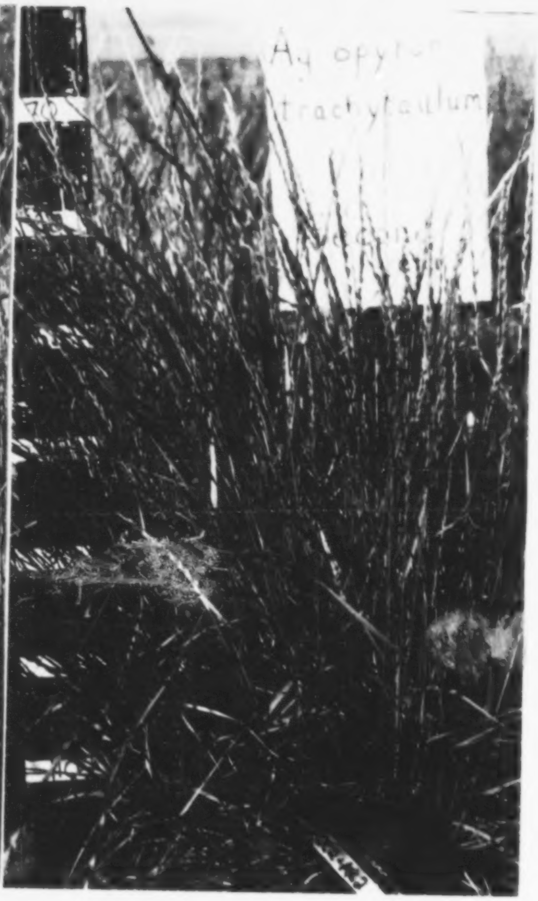
Stipa viridula
(green needle grass)

Stipa viridula (LODORM)
(green needle grass)

Fig. II–23b. Same as Fig. II–23a. Means and standard errors in Appendix 5–Table 18).

Plate II-1. Second year growth of *Agropyron dasystachyum* (site C), *Agropyron trachycaulum* (site C), and *Festuca hallii* (site D) on the experimental catena. Height markings in centimetres.


80
70
60
50
40
30
20
10
Agropyron
dasystachyum
Second
year


70
Agropyron
trachycaulum

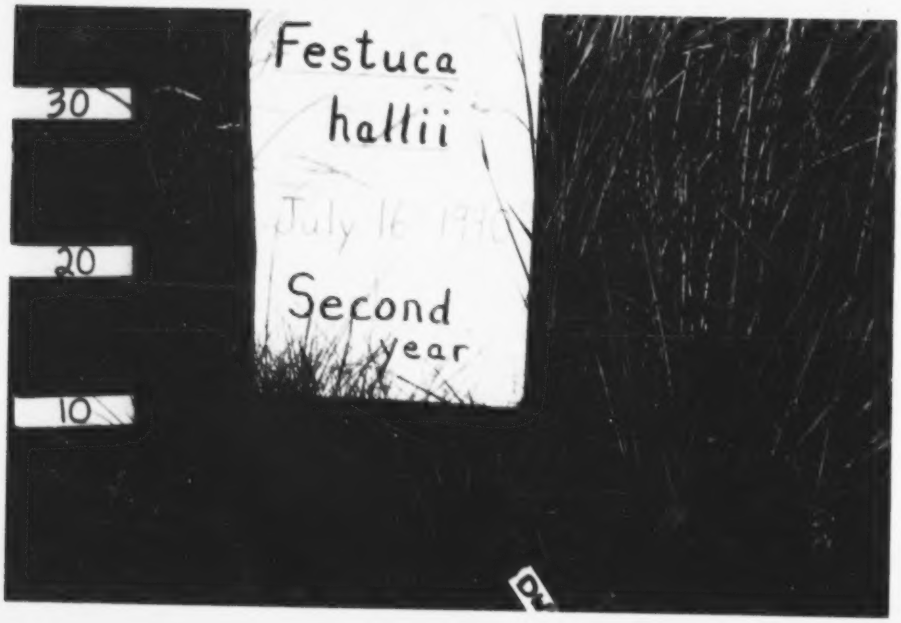
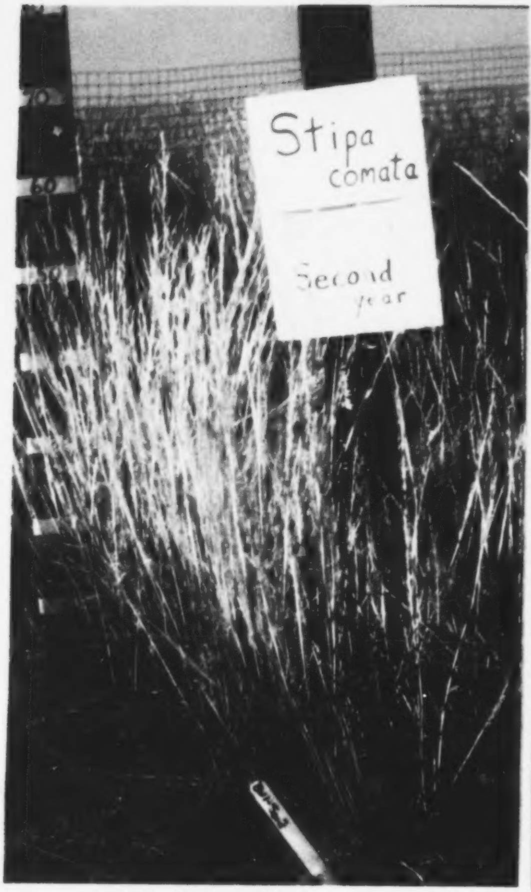
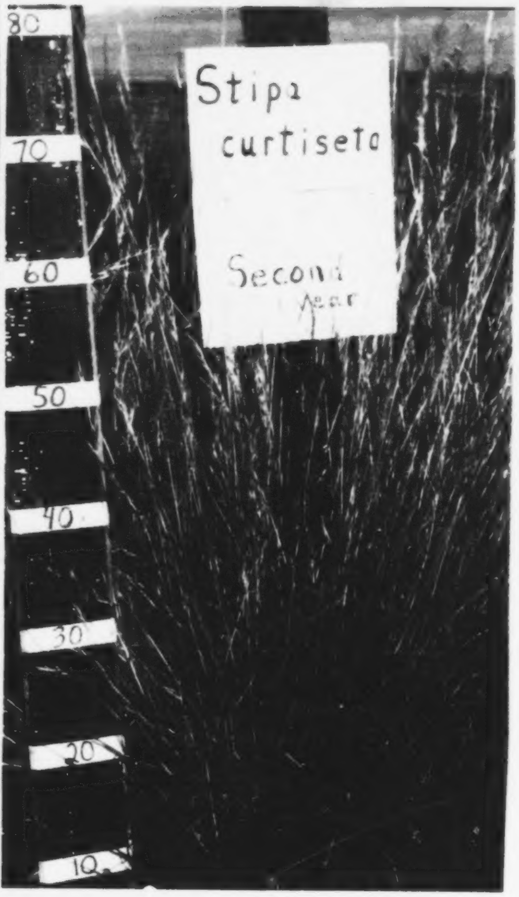
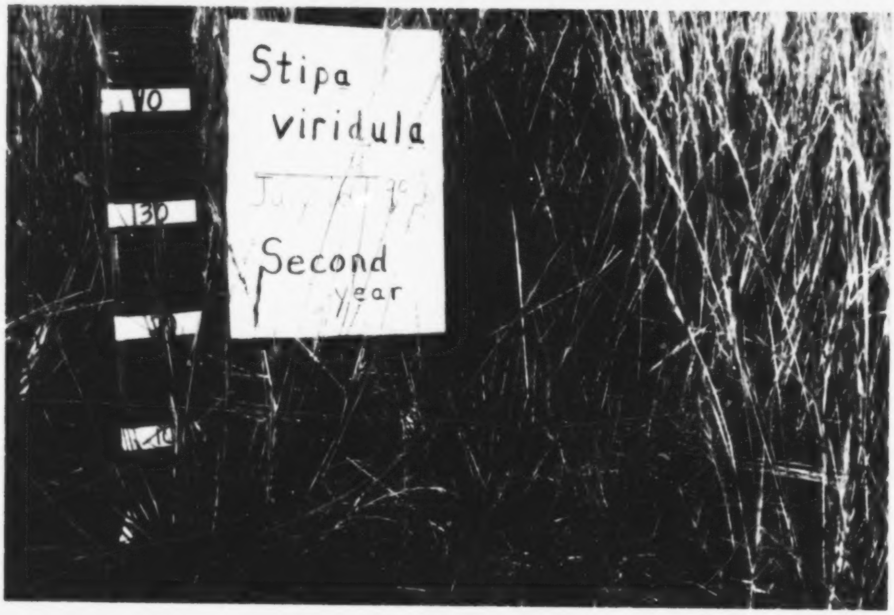

30
20
10
Festuca
hallii
July 16 1970
Second
year

Plate II-2. Second year growth of *Stipa comata* (site B), *Stipa curtiseta*, and *Stipa viridula* (site C) on the experimental catena. Height markings in centimetres.


70
60
Stipa
comata
Second
year


80
70
60
50
40
30
20
10
Stipa
curtiseta
Second
year


Stipa
viridula
Second
year

2.5.6.3. 1989 Tillers

The number of tillers produced during the first year of growth tended to follow the pattern exhibited by biomass production. More tillers were produced in sites with higher moisture and nutrient availability (Fig. II-24). The differences in tiller abundance observed along the catena were significant for *Agropyron dasystachyum, Bromus inermis*, and *Stipa curtiseta* (Table II-15). The irrigation treatment affected most species at some of the sites (LSM, Fig. II-24). A significantly greater number of tillers were produced in irrigated plots at most sites by *Festuca hallii*, *Stipa curtiseta*, and marginally by *Bromus inermis* ($p=0.056$) (Table II-15).

2.5.6.4. 1990 Inflorescences

The number of flowering culms produced per plant in 1990 was lower for most species in the alkaline lowland and for some species in the upper slope locations (Fig. II-25). This site effect was significant in all species except *Festuca hallii,* which did not flower, and *Agropyron trachycaulum* (Table II-16). Flower production in *Agropyron dasystachyum* and *A. trachycaulum*, and at an isolated number of sites in the other grasses (LSM, Fig. II-25) was significantly reduced by irrigation in the previous year (Table II-16).

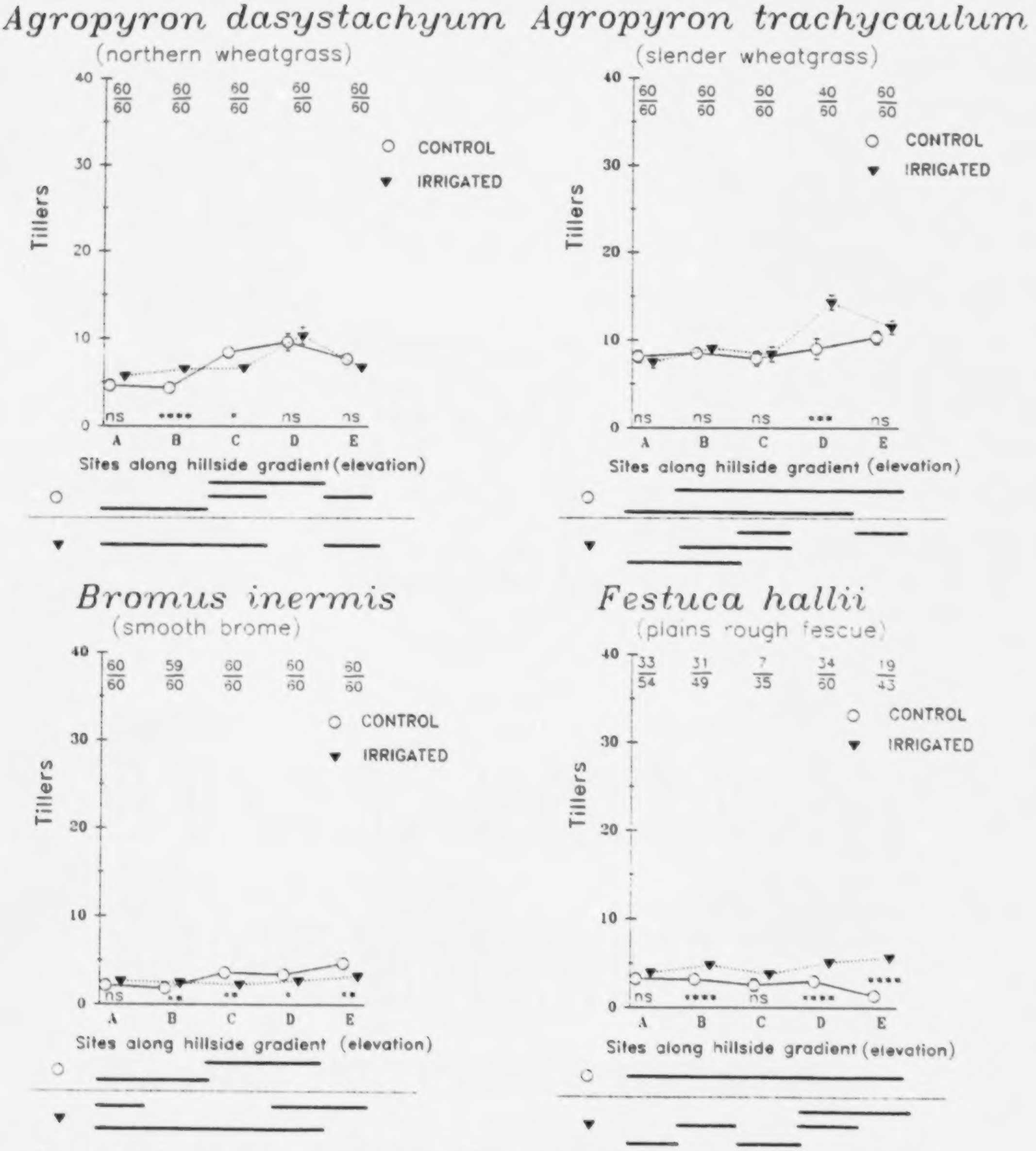
2.6. DISCUSSION

The experiment was designed to determine whether topographic position on a hillside influences the germination (*sensu* emergence), seedling establishment/survival, and above-ground productivity of six dominant native and one introduced grass species of the northern mixed-grass prairie. The gradient included the associated variations in the soil environment such as texture, chemistry, and moisture.

2.6.1. The Gradient

It is evident from the results that different positions along the topographic gradient provided different environments which influenced seed germination, seedling establishment and survivorship, and the production of tillers, inflorescences, and above-ground biomass of all seven prairie grasses.

There were substantive differences in soil texture, consistency, structure, chemistry, and taxonomy associated with the topographic gradient (Appendix 1 and Fig. II-11); these greatly influenced moisture availability. The time required for the deeper soil to dry to a water potential of -1.5 MPa was used to rank the sites for their moisture availability as follows; $A<B<D<C<E$ (Fig. II-9). Soil moisture increased from the sandy, rocky ridge (site A) to the lowland (site E)



Agropyron dasystachyum (northern wheatgrass)

Agropyron trachycaulum (slender wheatgrass)

Bromus inermis (smooth brome)

Festuca hallii (plains rough fescue)

Fig. II–24a. Least–squares mean (LSM) and S.E.M. of the number of tillers per individual at the end of the first growing season (1989) within control and irrigated moisture treatments at locations along the topographic gradient. Significance levels for difference between moisture treatments at each gradient location are listed on the x–axis (ns=not significant, *=≤0.05, **=≤0.01, ***=≤0.001, ****=≤0.0001). Lines connect means which are not significantly different (least–squares means comparison). Numbers are sample sizes of means for control (above) and irrigation (below) treatments. (Means and standard errors in Appendix 5–Table 19).

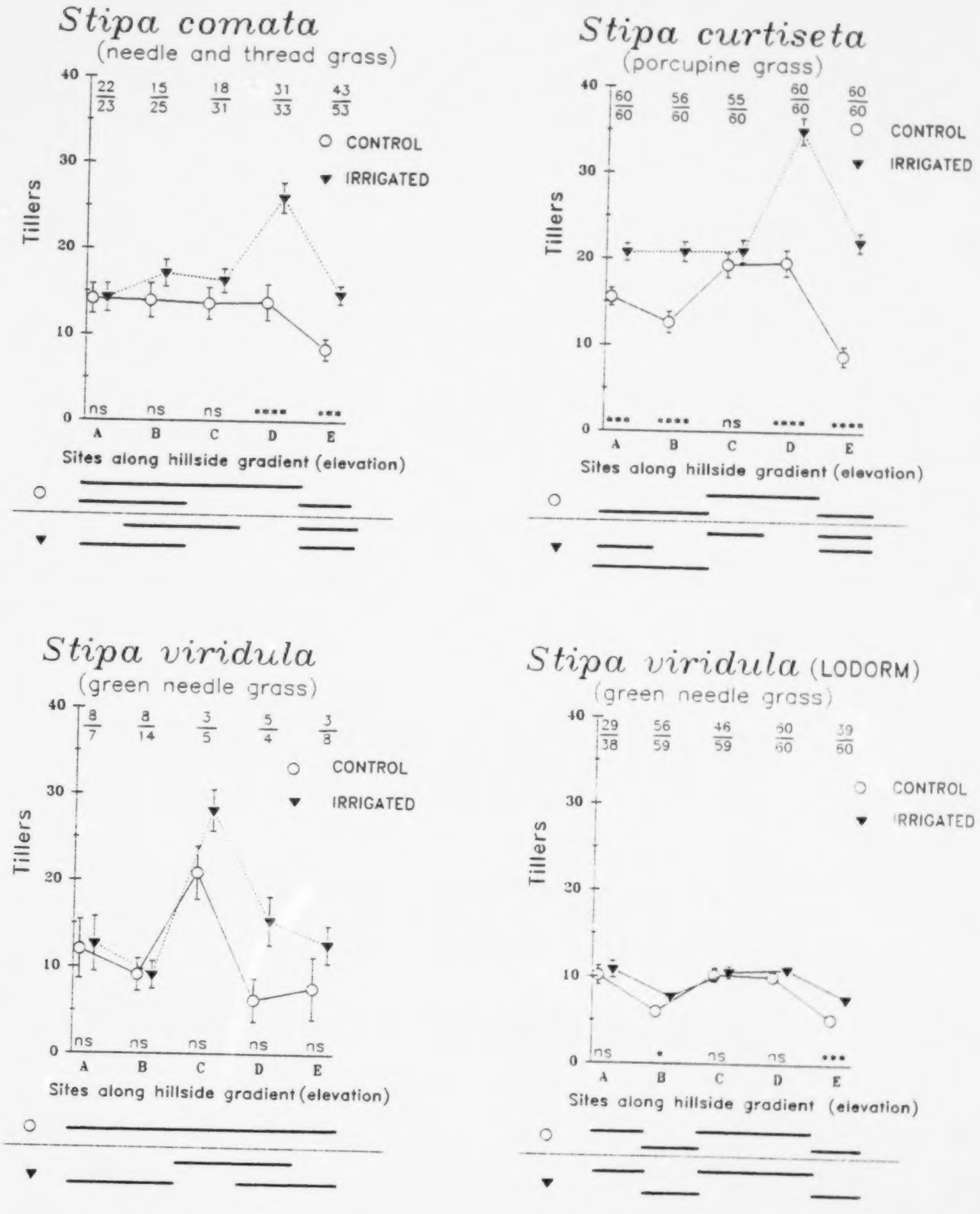


Fig. II–24b. Same as Fig. II–24a. (Means and standard errors in Appendix 5–Table 19).

Table II-15. Summary of ANCOVA results for tiller production in 1989. Absolute germination cohort date was the covariate.*

Source	DF	SS	MS	F	Pr>F
Agropyron dasystachyum:					
Site	4	1793.92	448.48	3.89	**0.04**
Moisture	1	8.64	8.64	0.07	0.79
Site x Moisture	4	306.28	76.57	0.66	0.63
Agropyron trachycaulum:					
Site	4	1034.26	258.56	3.19	0.06
Moisture	1	214.46	214.46	2.65	0.13
Site x Moisture	4	455.71	113.93	1.41	0.30
Bromus inermis:					
Site	4	235.19	58.80	8.46	**0.003**
Moisture	1	32.40	32.40	4.66	0.06
Site x Moisture	4	114.00	28.49	4.10	**0.03**
Festuca hallii:					
Site	4	16.48	4.12	0.16	0.95
Moisture	1	148.21	148.21	5.79	**0.04**
Site x Moisture	4	48.79	12.20	0.48	0.75
Stipa comata:					
Site	4	4767.55	1191.89	3.11	0.07
Moisture	1	1153.69	1153.69	3.01	0.11
Site x Moisture	4	1440.39	360.10	0.94	0.48
Stipa curtiseta:					
Site	4	11164.40	2791.10	4.47	**0.025**
Moisture	1	8382.17	8382.17	13.44	**0.004**
Site x Moisture	4	2579.36	644.84	1.03	0.44
Stipa viridula:					
Site	4	505.96	126.50	1.71	0.23
Moisture	1	106.86	106.86	1.44	0.26
Site x Moisture	4	153.70	38.43	0.52	0.72
Stipa viridula (Lodorm):					
Site	4	1491.79	372.95	1.97	0.18
Moisture	1	165.60	165.60	0.88	0.37
Site x Moisture	4	48.68	12.17	0.06	0.99

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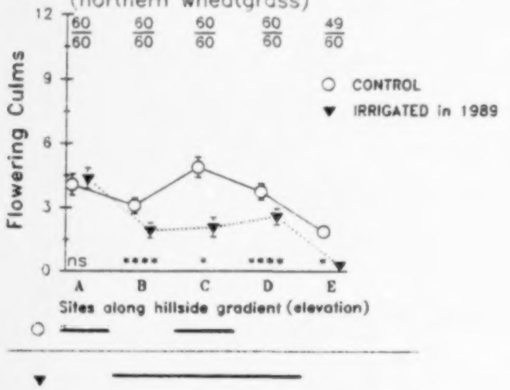
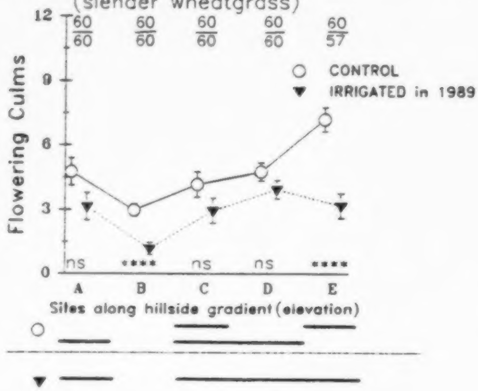
* See Methods for details and section 2.4.7 for analysis methods.

Fig. II-25. Least-squares mean (LSM) and S.E.M. of flowering culms produced per individual plant at the end of the second growing season (1990) in control and previously irrigated (1989) plots along the topographic gradient. Significance levels for difference between moisture treatments at each gradient location are listed on the x-axis (ns=not significant, *=≤0.05, **=≤0.01, ***=≤0.001, ****=≤0.0001). Lines connect means which are not significantly different (least-squares means comparison). Numbers are sample sizes of means for control (above) and previous irrigation (below) treatments. (Means and standard errors in Appendix 5-Table 16).

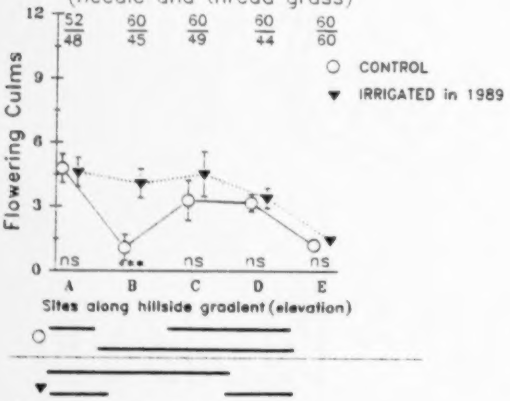
Agropyron dasystachyum
(northern wheatgrass)



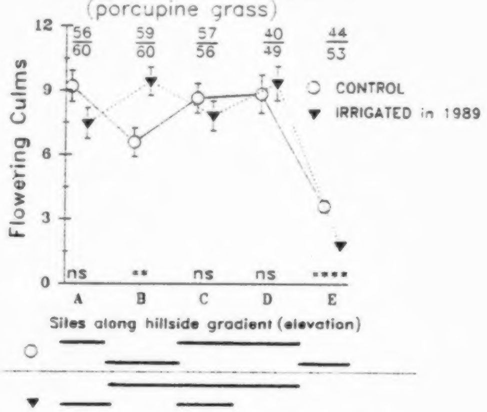
Agropyron trachycaulum
(slender wheatgrass)



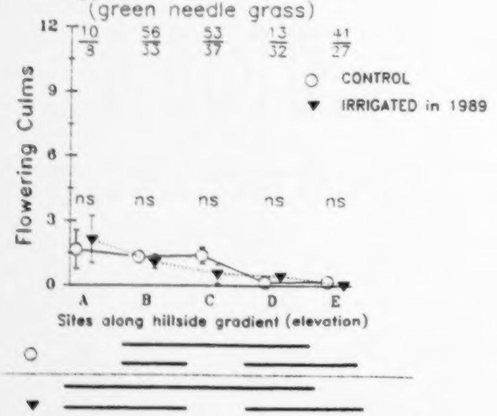
Stipa comata
(needle and thread grass)



Stipa curtiseta
(porcupine grass)



Stipa viridula
(green needle grass)



Stipa viridula (LODORM)
(green needle grass)

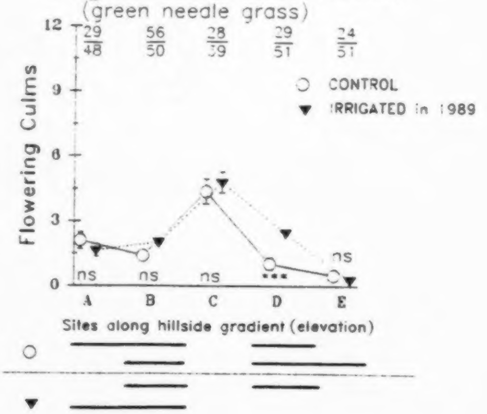


Table II-16. Summary of ANCOVA results for flowering culm production in 1990. Absolute germination cohort date was the covariate.*

Source	DF	SS	MS	F	Pr>F
Agropyron dasystachyum:					
Site	4	619.79	154.95	6.94	**0.006**
Moisture	1	241.18	241.18	10.81	**0.008**
Site x Moisture	4	146.59	36.65	1.64	0.24
Agropyron trachycaulum:					
Site	4	661.89	165.47	2.16	0.15
Moisture	1	372.48	372.48	4.85	**0.05**
Site x Moisture	4	59.16	14.79	0.19	0.94
Stipa comata:					
Site	4	1739.63	434.91	4.8	**0.02**
Moisture	1	92.37	92.37	1.02	0.34
Site x Moisture	4	255.48	63.87	0.71	0.61
Stipa curtiseta:					
Site	4	1880.38	470.09	10.90	**0.001**
Moisture	1	7.35	7.35	0.17	0.69
Site x Moisture	4	913.35	228.34	5.29	**0.015**
Stipa viridula:					
Site	4	102.14	25.53	3.50	0.055
Moisture	1	5.86	5.86	0.80	0.39
Site x Moisture	4	28.75	7.19	0.98	0.46
Stipa viridula (Lodorm):					
Site	4	580.89	145.22	8.32	**0.003**
Moisture	1	11.71	11.71	0.67	0.43
Site x Moisture	4	36.84	9.21	0.53	0.72

* See Methods for details and section 2.4.7 for analysis methods.

(Fig. II-9). The greater water holding capacity of the shallow clay layer in the mid-slope location (site C) gave this site the potential for higher moisture availability similar to the lowland (site E).

The gradient was characterized by site-specific differences which influenced moisture availability and plant growth capability. The ridgetop (site A) had relatively high organic matter and nutrient levels (Fig. II-11), but abundant rocky and pebbly morainal material reduced the available water per unit volume of soil and undoubtedly the soil moisture-seed contact. The upper slope (sites B and C) had lower nutrient levels and organic matter content (Fig. II-11), which may have been caused by more direct insolation producing hotter, drier, and poorer growing conditions and greater erosion on the steeper slope. The shallow clay layer of the mid-slope location (site C) (Fig. II-7), which had the capacity to hold more water, could become effectively drier than a sandy or loamy soil as a result of a lower (more negative) matric potential when precipitation was lacking. The lower slope (site D) had relatively high organic matter content and nutrient availability. The gleyed lowland (site E) was limited by a shallow fluctuating water table (Fig. II-7), very sandy soil (Fig. II-10) and high alkalinity (Fig. II-11). The alkaline conditions would effectively make the soil at this site drier to a seed or plant through a higher osmotic potential (Larcher, 1983).

It was evident that other gradients, such as those associated with the soil properties, were not correlated directly with the topographic gradient. These gradients were not investigated because the main objective was to determine how the topographic position along a hillside gradient influenced the establishment capability of the study species. Associated soil parameters were examined to explain the differences obtained among the species and elevational sites and not for their own inherent analysis.

2.6.2. Germination (*sensu* emergence)

Germination was controlled by moisture availability. Even though there was substantial precipitation during spring 1989 (Fig. II-6), lower germination was recorded in sites with poorer surface-soil moisture-holding capabilities (A, C, and E) (Fig. II-12 and Fig. II-9). The importance of water was further confirmed by the more uniform germination along the catena with irrigation (Fig. II-12). Even with irrigation, slight differences in germination were evident because of the differences in the moisture holding capacity of the soils along the catena. Germination of the native, hard-seeded *Stipa* species seemed less affected by moisture availability than that of the soft-seeded grasses (*Agropyron dasystachyum, A. trachycaulum, Bromus inermis*, and *Festuca hallii*). This difference was particularly evident from the ability of the needle grasses to germinate in the dry summer period and to survive better without precipitation.

Irrigation may have overcome germination difficulties imposed by soil texture in two ways. Better germination in most circumstances was due to a higher (less negative) water potential. Secondly, irrigation would have maintained a softer soil consistency and provided easier penetration of the coleoptile through the soil surface. The latter may explain the relative failure of *Festuca hallii* germination at the mid-slope location (site C) without irrigation (control) (Fig. II-12a).

Irrigation increased total germination and the spring germination rate (Fig. II-14). Suppression of germination in *Stipa* seeds by high temperatures during the mid-summer period was indicated by the lack of germination with adequate moisture from irrigation or periodic precipitation during this period. This warm period void of germination was followed by a slight flush of germination from *S. comata* and particularly from both moisture treatments of *S. curtiseta* in the beginning of September 1989 when temperature and moisture levels were similar to those of the main spring germination period (Fig. II-14b). Temperature levels and the variation in day/night temperatures have been found to affect germination in *Festuca hallii* (Romo et al., 1991). Hence, it is apparent that moisture availability did not completely regulate germination.

In 1990, germination only occurred in previously dormant seeds of the native *Stipa* species. Hard seed coats hampered the penetration of water and oxygen, thus preventing imbibition and germination of all the seeds in the first year. As was evident in 1989, the lower germination at the ridgetop location may have resulted from poor soil moisture-seed contact because of the rocky, sandy soil texture at this site (Fig. II-13). At the other sites, soil moisture holding capacity did not seem to influence germination as much as it did in 1989. The lack of correlation between soil moisture holding capacity and germination in the second year could be a response to the presence of established plants (Fowler, 1986), which may have had a greater influence on germination and soil moisture than the abiotic influences alone from soil texture, consistency, and structure.

Stipa comata differed from the other species; its increasing germination downslope may, by some unknown effect or association, have been influenced positively or negatively by soil chemical properties such as the reduction in phosphates or the increasing levels of ammonia and/or alkalinity (Fig. II-12b and Fig. II-13). The consistently greater number of *Stipa comata* germinants in the control moisture treatment in the second year could have been a result of lost viability and germinability in those seeds which were kept moist through irrigation and presumably respiring at higher levels than those unirrigated throughout the first growing season. Although not significant, this trend was also evident in *Stipa viridula*. The negative irrigation effect on germination in the latter species may have been caused by disease, insects, mortality in germinants before emergence, or some other factor stimulated by the constant higher moisture levels under irrigation.

Germination may not have been independent of neighbouring individuals. Within the *Stipa* species, which had lower germination over a longer period, more of the later germinants were observed close to established individuals. The higher germination in the proximity of earlier emergents could be a response to leachate from the previously germinated seeds (Bergelson and Perry, 1989) or reflect the location of a safe site; however, factors associated with proximity to an established plant have been known to have a negative influence on germination and survivorship (Fowler, 1986).

2.6.3. Survivorship

Seedling survivorship in 1989 was directly affected by moisture availability (Fig. II-16). For many species, particularly the soft-seeded grasses, mortality was greater at sites with drier or more alkaline soils, and these stresses were overcome or ameliorated in most cases by irrigation. *Agropyron trachycaulum*, for example, a species more abundant in natural lowland communities in LML NWA (Table II-2), succumbed to the much greater drought stress in the upper slope locations. *Festuca hallii* was particularly sensitive to surface soil drying as evidenced by the higher mortality following emergence at the drier sites. As a consequence, this grass performed worse in sites with lower surface-soil moisture holding capacity (A, C, and E).

In the 1989 control moisture treatment, higher mortality was observed for most germination cohorts during the dry period of late summer (mid-July to mid-August) (Fig. II-17). Late germinants, which did not become established during the moist spring period and presumably had not developed deeper roots into the moister soil strata, probably were under greater moisture stress from surface soil drying and competition from established plants. Consequently, proportionately more of these later germinants, particularly those of the soft-seeded grasses, did not survive.

The survivorship of the needle grasses was not as affected by moisture limitations as that of the soft-seeded species, unless the *Stipa* germinants were very young (Fig. II-17b). The loss of many needle grasses germinating in spring 1990 was likely a result of abnormally low precipitation. Abundant precipitation in June and July, however, did not reduce mortality of the native *Stipa* species. Competition from the established plants may have produced sufficient biotic stress (i.e. moisture and light stress) to induce mortality even if the abiotic stress from lack of precipitation was not present.

Survival of the 1990 *Stipa* germinants was greater in the control (unirrigated) treatment plots, at almost every site, compared to those which were irrigated the previous year (Fig. II-18). This significant difference, or trend, may have been a result of density-dependent mortality with comparatively less competition in the control plots which had fewer germinants and survivors in 1989. An alternative explanation, which appears more likely, is reduced seedling vigour in the seeds which were kept moist by the irrigation treatment in the previous year. Variation in the survivorship of *Stipa viridula* in 1989 may be attributable to the small number of germinants in 1989 (Fig. II-16b). The variability in the survivorship of the 1990 *Stipa* germinants (Fig. II-18), however, could have been a result of the interaction between moisture availability and competition from established plants.

At the end of the second growing season there was higher survivorship in five of the seven species as a response to irrigation the previous year (Fig. II-21). This was not the case for *Stipa comata* and *S. viridula* because most of their germination occurred in the second year and was affected negatively by the first year's irrigation treatment. Differences in total percent survivorship after two years were usually attributable to the differences between the moisture treatments in the first growing season (compare Table II-12 to Table II-6). The positive influence of irrigation on survivorship in *Agropyron dasystachyum, A. trachycaulum*, and *Festuca hallii* in the first year persisted to the end of the second year. In *Stipa comata* and *S. viridula*, however, the positive effect of irrigation on first year survivorship was later outweighed by the negative influence of the first year irrigation treatment on the survivorship of the second year germinants, either significantly or through an insignificant correlation, respectively.

The topographic gradient had a significant influence on the survivorship of most species. Total survivorship at the end of the second year significantly differed among the sites in all species, except *Agropyron dasystachyum* and *Stipa curtiseta* (Table II-12 and Fig. II-20). This survival pattern was attributed to the topographic influence on survivorship in the first year, with the exception of *Stipa viridula* which germinated predominantly in the second year (Table II-6 and Fig. II-16). Topographic position had a diminished, albeit significant, effect on the established second year plants of the same species (*Agropyron trachycaulum, Festuca hallii, Stipa comata*, and *Stipa viridula* (Lodorm)) (compare Table II-11 to Table II-6). The survivorship pattern produced by the influence of the topographic gradient differs between the two years, which may be a result of differences in moisture availability and/or the discontinuation of the irrigation treatment in the second year (compare Fig. II-16 to Fig. II-19).

2.6.4. Above-ground Productivity

The annual above-ground biomass accumulation of the eight grass species in this study was in most cases correlated to soil moisture availability along the topographic gradient. Moisture availability has been previously reported as the primary factor controlling community (Redmann, 1975; Barnes et al., 1983) and individual species productivity (Redmann, 1975; Knapp, 1984; Gurevitch, 1986) along prairie topographic gradients. Irrigation in 1989 significantly increased (1) tiller production in *Festuca hallii, Stipa curtiseta, S. comata*, and

Bromus inermis, particularly in the lower slope locations (Fig. II-24), and (2) shoot biomass within the soft-seeded species (Fig. II-22).

The patterns of biomass and tiller production between the control and irrigated moisture treatments in 1989 were very similar. The frequent lack of response to moisture addition by above-ground productivity indicates that soil properties other than moisture availability could be influential. *Stipa viridula* showed a major deviation from the trends in biomass and tiller productivity of the other species in 1989 because its peak production was in the high clay soil of the mid-slope location (site C).

It is assumed that second year plants in 1990 had deeper root systems than in their first year. These plants would have been less moisture-stressed from surface-soil drying and have had ample moisture from the abundant summer precipitation in 1990. Biomass and inflorescence production only increased slightly downslope along the topographic gradient, associated with the moisture gradient, until the lowland site where all species except *Agropyron trachycaulum* were greatly hindered by the high alkalinity. *Stipa viridula* (Lodorm), however, produced more above-ground biomass and flowering culms in the mid-slope high clay soil; the analogous location in the adjacent native vegetation was dominated by the native *S. viridula*. The greater mean individual biomass production of *Stipa viridula* on the ridgetop (Fig. II-23b) may have been a result of less intense competition between the substantially fewer germinants at this location compared to the rest of the sites.

Differences in how the topographic gradient affected productivity between 1989 and 1990 may be explained by differences in precipitation regimes between the two years. In 1989, the biomass and tiller data were collected after a month of very low rainfall; in 1990, the biomass and inflorescence data were collected after two months of adequate precipitation. As a result, there may have been greater amounts of overland water flow and downslope throughflow in 1990. A greater correlation between the moisture gradient and elevation in the second year should have resulted in the soils of the mid-slope (site C) and lowland (site E) locations not being as dry as in 1989. The production of biomass and tillers in 1989 was suppressed in sites with drier soils relative to moister sites. After a one month dry period, the whole upper and mid-slope and lowland sites became dry. Baines (1973) found that with a shifting precipitation-evaporation regime during one prairie growing season, the soil moisture availability along a topographic gradient also shifted. He observed the lowland progress from being comparatively wet in the early summer to becoming comparatively dry in the late summer as a result of the differences in soil texture along the gradient. The shift in moisture availability could have resulted partially from differences in transpiration because of plant size and water-use efficiency.

A trend was evident, particularly for *Agropyron trachycaulum* and at some sites for *A. dasystachyum* and *Festuca hallii*, which indicated that the biomass production in the second year was negatively influenced by the irrigation moisture treatment in the previous year. This difference in biomass may have been caused by competition and greater moisture stress in the second year resulting from higher establishment density and possibly shallower root development in the irrigated plots during the first year.

The production of tillers in 1989 was correlated to soil moisture availability (Fig. II-24). Flowering culm production in 1990 appears to be correlated with above-ground biomass production and presumably therefore, indirectly correlated with soil moisture availability (Fig. II-25). The number of flowering culms produced in the second growing season was not highly correlated with the number of tillers. The significantly lower production of *Agropyron dasystachyum* and *A. trachycaulum* flowering culms in the previously irrigated treatments may be linked to the reduced biomass production in 1990 as a result of the irrigation treatment in 1989. A few more individuals of these species established under irrigation. This may have created a slight density effect and accounted for some of the difference in flowering culm production.

2.6.5. Integration

Differences in morphology and physiology could be directly responsible for the disparity in germination, survivorship, and productivity obtained along the catena among species. These differences could possibly account for some of the variation among individuals within a species as well. Interspecific differences in seed size and seedling growth rate would influence their relative germination and establishment success. A small-seeded species, like *Festuca hallii*, would germinate and develop more slowly and be more sensitive to surface soil texture and moisture-holding capacity. The inability of the *F. hallii* germinants to withstand slight drought stress was evinced by the high mortality rate in new germination cohorts that did not receive moisture within one week, and also by the poor survivorship obtained within both the control and irrigated moisture treatments. This drought sensitivity was undoubtedly exacerbated by testing *F. hallii* in an unsuitable habitat. This can be supported by the species absence in the native community adjacent to the experimental sites (Table II-2). *F. hallii* is an infrequent dominant of the moist mixed-grass prairie and appears to be more predominant at LML NWA in the upland prairie communities with greater moisture holding capacity.

The depth and morphology of rooting, suspended growth (dormancy), and adaptation to soil and environmental conditions are a few other possible morphological and physiological reasons for differences in the survivorship and productivity along the topographic gradient among the investigated grasses. Root and particularly shoot production of grasses are suppressed by decreases in soil water potential (Majerus, 1975). Soil water potential can be reduced to varying degrees from differences in plant rooting depth, drought tolerance mechanisms, and thus water-use efficiency (Majerus, 1975). The rooting depth of grasses is fairly plastic and changes with slope aspect and soil texture. It can be generalized that most wheatgrasses (*Agropyron* spp.) are deeply rooted, needle grasses (*Stipa* spp.) are more shallowly rooted, particularly *Stipa comata*, and the mean maximum depth of root penetration of *Festuca hallii* is between these two groups (Coupland and Johnson, 1965). The wheatgrasses also produce rhizomes for vegetative reproduction which, over time, may enhance their survivorship and productivity. Needle grasses, particularly *Stipa comata*, have an opportunistic water-use strategy (Barnes and Harrison, 1982) whereby they can suspend their growth and become dormant after the available soil moisture has been depleted (Potvin, 1984). Being shallowly rooted, the xerophytic *Stipa* species benefit from light precipitation that does not penetrate into deeper soil layers (Harper, 1977). Although most species had higher germination, survivorship, and productivity at the more moist sites, some may be adapted for specific conditions along the catena. *Stipa viridula* responded favourably to the mid-slope, high-clay location, while *Agropyron trachycaulum* attained a higher productivity in the alkaline lowland compared to the other sites and species.

The performance in monoculture of each species differed between sites and reflected the abundance of these species along the gradient in the adjacent native community (compare Fig.II-23 with Table II-2). In comparison with species abundance in a native prairie community along a different Saskatchewan catena (Baines, 1973), the peak productivity of the experimental grasses in monoculture corresponded positively for *Agropyron trachycaulum* and *Festuca hallii* and negatively for *Agropyron dasystachyum* and *Stipa curtiseta*. This difference in species distribution and abundance may be explained by the large disparity that can occur in the establishment range of a species along an environmental gradient between a monoculture planting and a diverse mixture, such as a native prairie (Walter, 1979). Thus, as species richness increases in a community, individual plants and species may be eliminated from low productivity areas along a gradient where poor performance limits competitive ability, reproduction, and recruitment potential. Individuals would be lost through attrition or competition because they are near the threshold of the species' tolerance limits and consequently less fit or competitive for the shared resources, particularly water. Mixed-species interactions, as found in a native or restored community, may be responsible for the difference between the broader establishment (Fig. II-21) and productivity (Fig. II-22 and Fig. II-23) levels obtained along the topographic gradient in monoculture (i.e. wider amplitudes) and the narrower species distribution that develops in a multi-species community (Table II-2).

By performing this research on a single hillside and not replicating it at different locations and in different years, there are limitations on the significance of the results for other areas and topographic gradients. These limitations should be kept in mind when considering the results and recommendations or for incorporating these when implementing restoration or revegetation plans for another location.

Some factors not investigated may have influenced recruitment along the topographic gradient. The association of vesicular-arbuscular mycorrhizal (VAM) fungi and their influence on seedling establishment, survival, and plant productivity could have had unknown affects upon these factors measured. VAM spore abundance has been found to be negatively correlated with soil pH, gravimetric soil moisture, and available Ca, Mg, and P along a prairie soil moisture/nutrient gradient (Anderson et al., 1984). Microclimatic gradients could also be influential. Variations in aspect, soil colour and texture, and percent plant cover can cause slight differences in the temperature and relative humidity at the scale perceived by seeds and seedlings (Whitman and Wolters, 1967). Differences in seed viability would be responsible for differences in absolute germination between species. More importantly, it could influence germination and survival within a species along the topographic gradient. Differences in the microclimate or the abundance of mycorrhizae associated with the topographic gradient or seed viability may have had an influence on the results.

2.7. CONCLUSIONS

Variations in moisture availability, imposed by differences in soil properties and topography, were responsible for the non-uniform germination, survivorship, and, to a lesser degree, productivity of the planted native grasses and exotic *Bromus inermis* along the prairie topographic catena. The results obtained for each species and the differences among species may have been caused by differences in their morphology and physiology. Factors which could have played a role are seed size, growth rate, rooting characteristics, and physiological adaptations to specific environments.

The following general patterns of germination (total emergence after 2 years), survivorship (after 2 years), productivity (above-ground biomass in second year), and flowering (in second year) were observed for each native species. Included are the most suitable locations for planting these grasses along the experimental gradient. Recommended are both a broad range to reflect the entire extent of suitable use and a narrow range where the species performed the best. The broad range indicates the areas where the species should be used in a low species-diversity planting and the extent of possible inclusion in a high species-diversity planting. The narrow range indicates the section of the gradient where the species should form a higher relative composition and the ideal minimum range for use in a high species-diversity planting.

Agropyron dasystachyum

Germination: - high
- slight suppression from ridge to mid-slope
- slight benefit from irrigation
- all seeds germinate in first spring

Survivorship: - high
- little difference between moisture treatments and gradient sites

Productivity: - higher from mid- to lower slope (site C-D)
- lower in lowland (site E)

Flowering: - similar along the gradient except a marked decrease in the lowland

Best Planting Locations:
Broad: - entire upland excluding the lowland
Narrow: - mid- to lower slope

Agropyron trachycaulum

Germination: - high throughout gradient
- very slight benefit from irrigation
- all seeds germinate in first spring

Survivorship: - high
- greater mortality from upper to mid-slope section; irrigation beneficial here

Productivity: - higher from lower slope to lowland

Flowering: - greater on ridgetop and from lower slope to lowland

Best Planting Locations:
Broad: - entire slope
Narrow: - lower slope to lowland

Festuca hallii

Germination:
- moderate
- better on upper and lower slope
- irrigation greatly beneficial
- all seeds germinate in first spring

Survivorship:
- low to moderate
- better on upper and lower slope
- irrigation greatly beneficial

Productivity:
- higher from mid- to lower slope

Flowering:
- none

Best Planting Locations:

Broad: - upper to lower slope
Narrow: - lower slope

Stipa comata

Germination:
- moderate to high; increased downslope
- irrigation detrimental
- some germination in first year, mainly spring; most germination in second year, mainly spring; suspect some seeds still dormant after second growing season

Survivorship:
- high
- slight variations along the gradient

Productivity:
- greater on upper half of hillside gradient

Flowering:
- greater on upper half of hillside gradient

Best Planting Locations:

Broad: - entire upland excluding lowland
Narrow: - upper half of gradient

Stipa curtiseta

Germination: - moderate
- fairly consistent along gradient
- most germination in first year, mainly spring; some germination in second year, mainly spring; suspect some seeds still dormant after second growing season

Survivorship: - high
- no difference between moisture treatments and gradient sites

Productivity: - fairly similar along gradient although markedly reduced in lowland

Flowering: - similar along gradient although markedly reduced in lowland

Best Planting Locations:
- entire upland excluding lowland

Stipa viridula

Germination: - low to moderate
- decreasing slightly from upper slope to lowland
- very poor on ridgetop
- germination very poor in first year, mainly spring; considerable germination in second year, mainly spring; suspect many dormant seeds may remain after second growing season

Survivorship: - moderate to high
- unirrigated: variable along gradient
- previously irrigated: equivalent along gradient

Productivity: - marked increase on ridgetop due to much lower plant density
- higher on the upper half of the gradient

Flowering: - greater on the upper half of the gradient

Best Planting Locations:
Broad: - upper half of gradient
Narrow: - upper to mid-slope section

The suggested percentage composition planting mixture for each site along the experimental topographic gradient is:

Sites along topographic gradient from ridgetop (A) to lowland (E)

Species	**A**	**B**	**C**	**D**	**E**
Agropyron dasystachyum	5	10	10	10	0
Agropyron trachycaulum	15	10	15	35	100
Festuca hallii	0	0	0	10	0
Stipa comata	40	30	20	5	0
Stipa curtiseta	35	30	15	30	0
Stipa viridula	5	20	40	10	0

The following points should be considered when using the six investigated native grass species for prairie restoration or land reclamation. Individuals which germinate as part of a monoculture during a wet period in the first year have an excellent chance of surviving through the second growing season and becoming established, especially if planted in favourable 'safe sites' (*sensu* Harper, 1977). Individuals or species that germinate either later in the first year or in subsequent years, however, after other plants have become established, have less chance of successful establishment. Increased moisture, through higher precipitation, irrigation, or better soil moisture retention, has a positive effect on the first year germination and survivorship of most grasses. Irrigation in the first year can provide some positive carry-over for total survivorship after two years, particularly in the soft-seeded species. Irrigation during the first establishment year, however, provides little benefit for survivorship of late germinants or for productivity in the second year. Irrigating in the first year can also have a negative influence. This was apparent from the correlated reduction in second year germination of all the native *Stipa* species and may be responsible for the reduced inflorescence production of *Agropyron trachycaulum* and *A. dasystachyum* in the second year. The differences in species productivity along the catena suggest that competitive interaction in mixed-species plantings will, sooner or later, influence the distribution and abundance of each species in the established vegetation community. The next chapter examines the intraspecific and interspecific competitive ability of these native grasses and *Bromus inermis* under controlled environment conditions.

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III. Competitive Ability of Five Native Northern Mixed-Grass Prairie Grasses at Three Positions on an Experimental Moisture Gradient.

3.1. ABSTRACT

The influences of abiotic stress, competition, and herbivory are thought to be among the major forces influencing species composition of vegetation. Hence, change in the intensity of these factors produce the vegetation patterns evident along resource gradients. To examine how moisture stress influences competition in five native grasses and one exotic, a proportionally equal, competitive substitution experiment was run in a controlled environment for four months. Lots of 45 individual seedlings were planted in pots with ca. 30 l of soil in a systematic pattern. Each plant, except for the edge individuals, was surrounded equidistantly by four intraspecific or interspecific competitors. Pots were placed in two growth rooms by restricted randomization and rotated weekly in a systematic manner within each room. At the end of the growing period, above-ground biomass was collected from a subsample of individuals in each pot. Three moisture treatments, including dry (watered at 6 to 8 weeks), moist (watered every 3 to 4 weeks), and wet (watered weekly), were used to assess the relative competitive ability of each native grass at three levels of moisture.

Competition and water stress had a negative influence on all species. Relative interspecific competitive ability differentiated the grasses into those which are stress-tolerant, often slower-growing, and less competitive (*Stipa curtiseta, S. comata*, and *Agropyron trachycaulum*), and those which are more productive, have a higher potential growth rate, and a greater competitive ability (*S. viridula* and *A. dasystachyum*). The competitive ranking of *A. trachycaulum*, an alkali-tolerant species, increased with reduced moisture availability making it a stronger competitor with traits similar to the other stress-tolerant species. The competitive ability of the five native study grasses increased with reduced moisture availability relative to the phytometer, *Bromus inermis*. Results suggest that tolerance of stressful environmental conditions is probably less important than competitive exclusion in determining species distribution patterns along abiotic gradients.

Hierarchical ratings are given for the relative competitive abilities among the grasses at the three moisture levels.

3.2. INTRODUCTION

Grassland vegetation along a topographic slope frequently forms a series of plant communities. This results from variations in the distribution and abundance of species associated with differences in environmental conditions and resource availability. The shift in species composition along prairie catenas has been correlated with changes in soil moisture by numerous workers (Ayyad and Dix, 1964; Dix, 1958; Baines, 1973; Crist and Glenn-Lewin, 1978; Barnes and Harrison, 1982; Nelson and Anderson, 1983; Werger et al., 1983; Barnes et al., 1984; Barnes, 1985; Butler and Goetz, 1986; Coxson and Looney, 1986; Gurevitch, 1986; Shumar and Anderson, 1986). The influences of abiotic stress, competition, and herbivory are thought to be among the major forces influencing species composition of vegetation, and hence change in the intensity of these factors produce the vegetation patterns evident along resource gradients (Grime, 1973; Potvin, 1984; Gurevitch, 1986; Wilson and Keddy, 1986a; Tilman and Wedin, 1991; Wilson and Tilman, 1991).

This research project focuses on the influence of moisture stress on competition. "Competition" is defined as the induction of strain (i.e. 'deleterious or suboptimal physiological states') in one organism as a direct result of the use of resource items by another organism (Welden and Slauson, 1986). "Abiotic stress" is defined as an external condition, apart from the activities of other organisms, that induces strain in an organism (Welden and Slauson, 1986).

Two basic theories have developed concerning the mechanism of competition along resource gradients. The Tilman (1982) theory states that the species which inhabit stressful sites (i.e. in the abiotic sense of low resource availability and/or high disturbance) prevail by competitively excluding the species which are better competitors at the other end of the gradient (i.e. in fertile and/or low disturbance sites). The Grime (1979) theory states that in stressful sites the better competitors are not excluded but are unable to tolerate the physical limitations of the environment, thus could not establish and survive in these sites even without interspecific competition.

The difference between these two theories is based on the response to, and the intensity and mechanism of, competition along a resource gradient. Grime (1973) and Wilson and Keddy (1986b) contend that competition is more intense, and the superior competitor(s) should be found, where abundant resources promote productivity, disturbance is infrequent, and environmental stress is low. Keddy and Shipley (1989), Campbell et al. (1991), and Johnson and Aguirre (1991) also suggest that there are no trade-offs between above- and below-ground competitive abilities along resource gradients because roots and shoots are integrated units and any reduction in the growth of one component would result in reduced growth in the other. The reduced competitive ability would be reinforced both above and below-ground with concomitant reductions in resource capture. Alternatively, Tilman (1988) suggests that "total competition" along a resource gradient is constant, although a qualitative change in the mode of competition exists, with competition being more intense for soil resources in unproductive sites and for light in productive sites. He hypothesized that under the constraints imposed by resource limitations, there are different trade-offs in competitive attributes, such as root to shoot biomass allocation, and that these trade-offs are related to the mechanisms for intraspecific and interspecific competitive ability (Tilman, 1990a).

Although the competitive mechanism differs between these two theories, the species distribution or community development predicted along the resource gradient may be equivalent. Wilson and Keddy (1986a) postulate that species' distributions along an environmental gradient are related to their competitive abilities and that the competitive hierarchy among species will be altered by the environment along the gradient. Without examining the mechanisms by which competition was operating, they found that the distribution of six out of seven species along a shoreline exposure gradient was correlated with competitive ability. The relative positive or negative interaction effects of species should determine the structure of plant communities (Aarssen, 1988). Not much is known, however, about the relative ability of species to compete in different environments (Caldwell, 1987) or the variability in competitive ability along abiotic gradients because of the paucity of relevant experimentation (Wilson and Tilman, 1991). Although changes in nutrient status (Aerts et al., 1990; McGraw and Chapin, 1989) and experimental location (Mehrhoff and Turkington, 1990) have elicited reversals in species competitive hierarchies, differences in soil moisture availability have only been implicated in competitive outcome reversals (Fowler, 1982; Allen, 1982; Rice and Menke, 1985; Fowler, 1990). Keddy and Shipley (1989) suggested that reversals in the order of species competitive ability along an environmental gradient should be common if Tilman's theory is correct.

The objectives of this study were: (1) to assess, by means of growth experiments, the relative competitive abilities of five major native grasses of the northern mixed-grass prairie at three positions along a gradient of soil moisture availability using *Bromus inermis*, an invasive exotic, as a "phytometer" (*sensu* Gaudet and Keddy, 1988); and (2) to study the order of competitive ability among the native grasses and determine if the species rank order changes along the moisture gradient.

The outcome of these experiments will elucidate whether biotic stress, as stated by Tilman (1982), or abiotic stress, indicated by Grime (1979), is more important in shaping species distribution patterns along resource gradients. This study will also examine Wilson and Keddy's (1986a) hypothesis that the competitive hierarchy among species is influenced by the resource levels along a gradient and the resulting changes in species competitive abilities will determine species distribution patterns in a vegetation mosaic.

3.3. METHODS

3.3.1. Experimental Design and Treatments

A proportionally equal, competitive substitution experiment (*sensu* Gaudet and Keddy, 1988; and Wilson, 1988b) was run for four months to assess (1) the influence of *Bromus inermis*, an exotic grass, on the above-ground biomass yield of five native grasses as compared to monocultures of the same species, and (2) the influence of these species on *B. inermis*. A large pot, 38 cm in diameter and 30 cm in depth, with ca. 30 l of soil was used as the experimental unit to prevent forced root competition in a small soil volume and allow root stratification in the sandy loam (70% loam:30% sand) planting medium. A template was used to produce a systematic planting design. Rows of alternating planting positions produced a pattern in which the individuals in each row were 6.5 cm apart and every plant away from the edge of the pot was surrounded equidistantly at 4.5 cm by four other individuals (Fig. III-1). Each pot contained 45 plants (equivalent to 420 plants$\cdot$m^{-2}); in the interspecific pots there were 24 of *Bromus inermis* and 21 of one of the native grass species, respectively; the intraspecific control pots were monocultures.

The pots were positioned in four rows on growth benches in each of two University of Alberta Phytotron growth rooms by restricted randomization for all species, competition interactions, and moisture treatments. The restriction in the random positioning prevented all three replicates of a treatment from being placed in one room. The rooms had high-intensity sodium and mercury lighting; the quantum light measurement from 28 pot locations throughout each room varied from 177 to 306 and 133 to 327 μE$\cdot$m$^{-2}\cdot$sec^{-1} with averages of 235 and 231 for the two rooms, respectively. The air temperature fluctuated diurnally with a 25 °C period and 15 °C period and varied as much as 2 to 3 degrees around these settings. The warm period coincided with a 16 hour photoperiod. Relative humidity was ca. 60% during the light period and from 80% to almost 100% during the dark period. Temperature and humidity were recorded with hygrothermograph sensors positioned at various locations in each room. To compensate for variability in lighting and temperature within each growth room, the pots were shifted four pot positions weekly. They were rotated in the direction from the outside two rows into the middle two rows and *vice versa*.

A moisture treatment was included in the experimental design to permit assessment of the relative competitive ability of each native grass species with *Bromus inermis* in arbitrarily defined dry, moist, and wet moisture regimes. All treatments were top-watered with sufficient distilled water to produce some drainage. Periodicity of watering was varied to produce the three treatments. All treatments were kept moist for the first two weeks after planting before the separate moisture treatments were initiated. After this initial establishment period, the dry

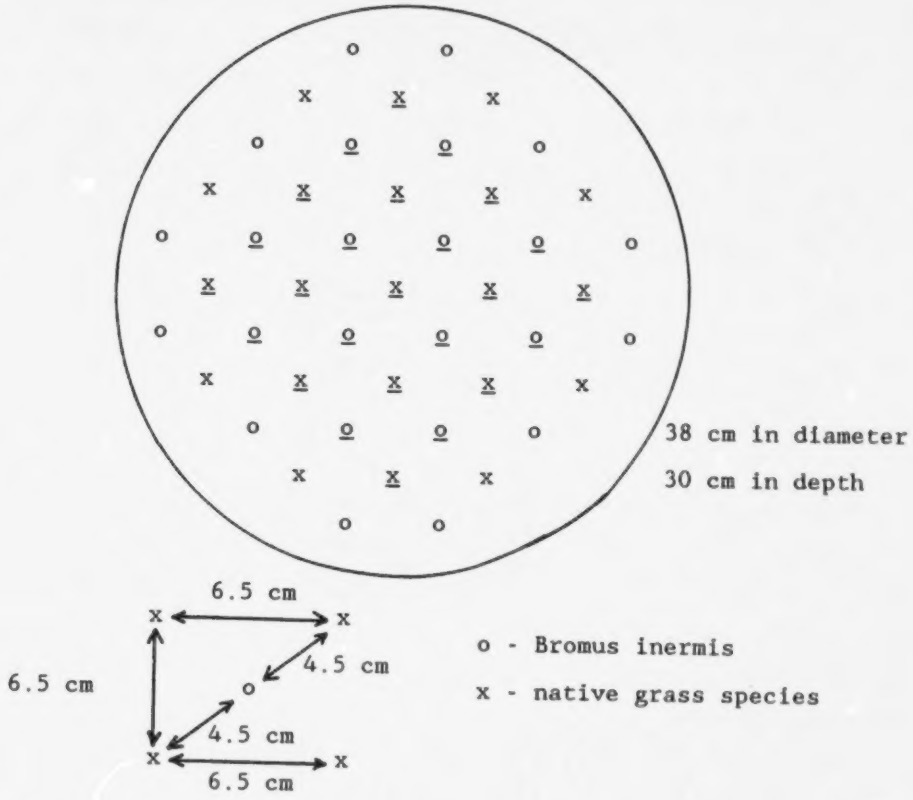

38 cm in diameter
30 cm in depth
6.5 cm
6.5 cm
4.5 cm
4.5 cm
6.5 cm
o - Bromus inermis
x - native grass species

Fig. III-1. Design and planting locations for one experimental unit (pot). Seedlings in mixed-cultures planted in locations as illustrated. All planting locations occupied by one species in monocultures. 13 individuals (underlined) were harvested for data collection. One *Bromus inermis* plant in addition to the 12 underlined was collected.

treatment was watered at 6 weeks and 14 weeks; the moist treatment was watered at 3, 6, 10, and 14 weeks; the wet treatment was watered weekly. There were three replicate pots for each competitive interaction and moisture treatment, except two in the monocultures of *Bromus inermis*.

3.3.2. Study Species

The grass species used in the experiment were *Agropyron dasystachyum* (Hook.) Scribn. (northern wheatgrass), *Agropyron trachycaulum* (Link) Malte (slender wheatgrass), *Stipa comata* Trin. & Rupr. (needle and thread grass), *Stipa curtiseta* (A.S. Hitchc.) Barkworth (porcupine grass), *Stipa viridula* Trin. (green needle grass), and *Bromus inermis* Leyss. (smooth brome). All of these species are common in and only *B. inermis* is not native to the northern regions of the mixed-grass prairie in the North American Great Plains (Looman, 1982). The community distribution of these species spans a wide range of grassland moisture availability. Along a gradient of increasing moisture availability, the usual order of peak abundance is *S. comata*, *S. curtiseta*, *A. dasystachyum, S. viridula*, and *A. trachycaulum* (pers. obs., S. Sask.). Voucher specimens are stored in the University of Alberta Herbarium (ALTA) in the Dept. of Botany.

Agropyron dasystachyum is a sod-forming species with long, creeping rhizomes, loosely tufted culms 4 to 13 dm in height, and narrow flat or involute leaves (Moss, 1983). It is a deep-rooted (110-152 cm, Coupland and Johnson, 1965), drought-resistant grass that prefers medium to coarse-textured sandy soils, but also performs well on shaley clays (Hardy BBT Ltd., 1989). This grass is common in the northern Great Plains and intermountain area in the brown and dark brown soil zones of the mixed-grass prairie and aspen parkland ecoregions, predominantly in dry sites. Its distribution ranges from heavy-soiled valley bottoms to lighter-soiled hillsides in regions with at least 20 cm precipitation. It tends to be competitively excluded if the mean annual precipitation is greater than 46 cm (Hardy BBT Ltd., 1989).

Agropyron trachycaulum is a bunchgrass, 5 to 15 dm in height, with long, wide, flat leaf blades (Moss, 1983). Individuals are comparatively short-lived, have a tufted growth form, but are somewhat rhizomatous (Hardy BBT Ltd., 1989); and are rooted to a depth of 60-97 cm (Coupland and Johnson, 1965). This species is moderately to highly tolerant of alkaline soil conditions and although it is considered a mesophytic species, inhabits moist to semi-arid habitats of Canada and United States and prefers medium-textured, well-drained soils. It is common in areas of saline prairies and open woods (boreal forest to subalpine and subarctic) where annual precipitation is greater than 40 cm (Hardy BBT Ltd., 1989).

Stipa comata is a bunchgrass with flat or involute leaves and a height of 3 to 7 dm (Moss, 1983). It is moderate- (63-110 cm, Coupland and Johnson, 1965), to shallow-rooted (Potvin, 1984) and is abundant in areas with dry, sandy, coarse-textured soils (Coupland and Johnson, 1965). This is a very common species on dry sites within the prairie and parkland ecoregions of North America (Looman and Best, 1979).

Stipa curtiseta is a bunchgrass with flat or involute leaves and a height of 4 to 6 dm (Moss, 1983). It is rooted to a depth of 60-140 cm and usually has deeper roots than those of *S. comata* (Coupland and Johnson, 1965). It inhabits soils with greater moisture availability and more loamy texture than those of *S. comata* (Coupland, 1950). This species is common in moist grassland throughout the prairie, aspen parkland, and Rocky Mountain ecoregions, replacing *Stipa comata*, often as the dominant, on these moister sites (Looman and Best, 1979).

Stipa viridula is a strongly tufted bunchgrass and a more mesophytic species than the other two *Stipa* species (Coupland, 1950). It has relatively wide leaves and attains a height of 4 to 8 dm (Moss, 1983). Its rooting depth is from 60-110 cm, usually similar to *S. curtiseta* (Coupland and Johnson, 1965). This grass is common in the prairie grassland on moist, clay-rich soils, particularly in sites that receive over 38 cm annual precipitation; however, it may be found in areas that receive only 25 cm (Hardy BBT Ltd., 1989).

Bromus inermis is a strongly rhizomatous grass with broad, flat leaves and a height of 2 to 15 dm (Moss, 1983). It is a highly competitive grass introduced from Europe where it is common in moist meadows and woodlands and disturbance sites, such as shorelines and roadways (information from herbarium specimens). In North America it has been used extensively for agriculture, road-side planting, and reclamation. With this widespread distribution it has become a common invader of moist native grasslands and disturbed sites. It was used as the competitive phytometer.

3.3.3. Seed Sources and Storage

Seeds of all six species were collected from sites within the Last Mountain Lake National Wildlife Area in southern Saskatchewan in the summer of 1988 or 1989. The seeds were air-dried and stored at ambient temperatures, then transferred to hermetically sealed containers in the fall and stored at 2 °C. Seeds from single collection locations were used for each species (Appendix 7).

3.3.4. Seed Preparation and Planting

Due to recurring fungal infections on the germinating seeds of *Stipa comata* and *S. viridula*, the experiments with these species started at a slightly later date than the other species but ran concurrently for the most part. For *Agropyron dasystachyum, A. trachycaulum*, and *Stipa curtiseta,* seeds were placed in Petri dishes on filter paper moistened with distilled water and enclosed in clear plastic bags to maintain high humidity and allow passage of light. These trays of seeds were cold-moist stratified at 6 °C for 2 weeks, then transferred to a phytotron growth room with alternating day/night temperatures of 25 °C (16 hours) and 15 °C, respectively. Same-aged and -sized seedlings were planted on 4 and 5 February 1990, with the exception of the third replicates of *A. dasystachyum* and *A. trachycaulum,* which were planted one week later due to a shortage of equivalent-sized individuals.

Seeds of *Stipa comata* and *S. viridula* were scarified with 95% sulphuric acid for 8 and 10 minutes respectively, planted into propagation trays, moistened with 0.055% gibberellic acid, enclosed in plastic bags, and cold-moist stratified at 2 °C for ca. one week before germination. This procedure was used for these species because uncontrollable fungal growth destroyed numerous attempts to germinate the scarified seeds on moistened filter paper in Petri dishes. Attempts to kill or control fungal growth with a 5% solution of bleach or with benolate powder were unsuccessful and greatly reduced germination. Seedling plugs of these grasses were planted on 9 May (*S. viridula*) and 14 May (*S. comata*), while the third intraspecific replicates of *Stipa curtiseta* were planted with Petri dish germinants on 15 May 1990.

The experiments ran for 122 and 119 days for the two groups of grasses with slightly off-set commencement dates. For both groups, germinants of equivalent size were transplanted into the appropriate locations in each pot (Fig. III-1). Any individuals which were lost due to transplant shock were replaced with others of a similar size. If replacement of an individual occurred after one week, the replacement was marked and not used for data collection. Only a small number of individuals required replacement, and all of these were near the beginning of the experiment.

3.3.5. Data Collection

3.3.5.1. Gravimetric Soil Moisture Content

A subsample of whole-pot soil weights were recorded at intervals from the same 2 or 3 pots in each moisture treatment. The data were collected immediately before watering every three and then four weeks for the moist and wet treatments; every six and then eight weeks for the dry treatment. After biomass harvest, the entire soil volume from this subsample of pots was oven-dried at 105 °C for more than one week. Soil moisture contents as percent dry weight of soil were then obtained for each weighing period. The above-ground biomass at harvest composed less than 0.5 percent of the potted soil unit mass, thus the weight of the plant biomass had a negligible influence on the *in situ* weight change of the soil and the percent dry weight moisture content measurement of the soil. Pressure plate analysis was performed on the sandy loam soil to determine the percent soil moisture content at -0.02 and -1.5 MPa.

3.3.5.2. Harvesting and Biomass Determination

Above-ground biomass sampling was completed during the periods 5 and 6 June 1990 and 4 and 5 September 1990 for the two experimental groups. A subsample of 13 plants, which were each surrounded equidistantly by 4 or occasionally 3 intraspecific competitors, was taken from each monoculture pot. In the mixed-cultures, the subsample of 13 individuals was collected from the same locations as those in monoculture and 13 plants of the competing *Bromus inermis* were also collected (Fig. III-1). Each plant collected was individually bagged, air-dried, and stored at ambient temperature (ca. 20 °C). Biomass samples were oven-dried at ca. 65 °C for at least 48 hours and weighed individually on an analytical digital balance to 10^{-3} g precision.

3.3.6. Data Analysis

Analysis of variance was used to analyze the biomass of the grasses with the SAS GLM (General Linear Models) statistical procedure (SAS, 1985). Least-squares means (LSM) were used to make comparisons between moisture treatments within each competition treatment, for both *Bromus inermis* and the native grasses. These comparisons also were made between intraspecific and interspecific competitive treatments within each moisture treatment for the native grass species. To test for a growth room effect, paired t-tests were used within treatments between mean individual biomass of pots within a room and pots in different rooms.

Individuals that produced flowering culms were removed from the biomass data sets because of the large increase in weight caused by seed production. This had little influence on the sample size of the data sets, except for *Agropyron trachycaulum* in the wet treatment. All statistical analyses were performed using data sets with the actual numbers and not percentages. P probabilities of 0.05 or less were considered significant.

To examine the competitive influence of *Bromus inermis* on the native grasses and the relative competitive ability among the native grasses, a Yield Suppression Ratio (Aarssen, 1988) was calculated for each species as follows:

$$YSR_{ij} = (Y_{ij}/Y_{ii}) \ / \ (Y_{ji}/Y_{jj})$$

where the first proportion is smaller than the second. Y_{ij} is the mean yield of a native grass (species i) in mixture with *Bromus inermis* (species j), and Y_{ii} is the mean yield of the native grass in monoculture. Y_{ji} and Y_{jj} represent the values for *Bromus inermis*. The value of YSR_{ij}

ranges from 0 to a maximum of 1.0. A value of 1.0 indicates that the competitive abilities of species i and j for resource capture are equivalent. A value approaching 0 reflects greater dissimilarity in competitive abilities. Fifteen iterations of random pairings of data sets Y_{ij}, Y_{ii}, Y_{ji}, and Y_{jj} were made to establish an average mean YSR_{ij} and error level (Manly, 1991). At 15 iterations and higher, the mean and error level became constant. Ratios were determined from random pairings because no natural pairing of individuals existed.

The amount of strain that competition induces in an organism can be expressed as the "intensity of competition" (Welden and Slauson, 1986). In this experiment, intensity of interspecific competition would be the difference in individual yield between mixed-cultures and monocultures. To take into account the differences in absolute biomass yield among treatments, the relative intensity of interspecific competition was obtained by expressing the difference in biomass yield between the two cultures as a proportion of the culture with the largest yield (Stadt, 1992). Likewise, this method was used to determine relative intensity of moisture stress in monoculture and mixed-culture. As with the Yield Suppression Ratio, the data sets were subjected to 15 iterations of random pairings to determine average mean and error values.

Since proportional (percentage) data can not be tested directly, the means and error values for figures demonstrating proportional data (%) were derived by averaging fifteen iterations of each point.

3.4. RESULTS

3.4.1. Soil Moisture Content

Soil moisture content, measured in pots just prior to watering, fluctuated slightly over the experimental period, but two trends were exhibited. Moisture content was higher during the initial period when the plants were small, particularly in the moist treatment (Table III-1). The higher moisture conditions were more pronounced and lasted longer in pots containing *Stipa curtiseta*, which is a slower-growing grass. The average (standard error) pre-watering percent dry weight moisture contents were 5.95 (.35%, n=2), 8.16 (.53%, n=15), and 13.58 (1.12%, n=10) for the dry, moist, and wet treatments, respectively.

Table III-1. Percent soil moisture content of a subsample of pots at periodic intervals just prior to watering (soil wet weights (kg)).

Days after planting	Moisture Treatment					
	Dry	Moist			Wet	
	AAt*	AAt	EAt	AScu	AAt	EScu
28	-	-	-	-	18.1(38.0)	-
39	-	10.5(35.9)	10.0(34.9)	13.6(36.4)	14.5(36.9)	9.4(34.7)
59	6.3(34.0)	6.7(34.6)	6.9(33.9)	9.3(35.1)	8.9(35.0)	8.4(34.4)
88	-	6.1(34.4)	6.8(33.9)	6.4(34.1)	15.2(37.1)	12.2(35.5)
109	-	9.3(35.5)	8.0(34.2)	7.5(34.5)	17.3(37.8)	17.1(37.1)
119	5.6(33.8)	7.5(34.9)	7.1(34.0)	6.7(34.2)	16.4(37.5)	16.4(36.9)
Soil dry wt. (kg)	32.0	32.5	31.7	32.1	32.2	31.7
Sample size	2	15			10	
Mean %	5.95±.35	8.16±.53			13.58±1.12	

* - first letter represents intraspecific (A) or interspecific with *Bromus inermis* (E); following letters represent species: At - *Agropyron trachycaulum*, Scu - *Stipa curtiseta*

3.4.2. Moisture Treatment

The moisture treatment effect was highly significant (Table III-2). There was greater average above-ground biomass attained for all species and competitive interactions with increasing moisture (Fig. III-2). This trend of increasing biomass with increasing moisture was rarely significant for the native grasses when competing with *Bromus inermis*. The exceptions were *Stipa comata* and *S. viridula* where the difference in plant growth between the moisture extremes was significant. In contrast, every native grass species had significantly greater above-ground growth in monoculture with each increase in moisture level (Fig. III-2). The limitations on above-ground growth due to moisture stress differed among the grasses, but the comparative response of the grasses to the two levels of moisture stress (i.e. the dry and moist treatment) was similar (Fig. III-3).

A room effect was observed in 3 out of 30 pairwise comparisons, within species and treatments, of mean individual biomass per pot of monocultures within a room and between rooms. This effect was judged to be insignificant and no other room effects were found.

3.4.3. Comparative Yield

The effect of competition with *Bromus inermis* was highly significant (Table III-2). There was a significant reduction of individual above-ground growth for all native species and under all moisture levels from competition with *Bromus inermis* as compared to monocultures (LSM, Fig. III-2). The limitation on growth differed with species and watering regime. The difference in yield between mono- and mixed-cultures increased with increasing moisture supply (Fig. III-2). The exception was *Stipa viridula,* which attained the highest comparative yield in the moist treatment (Fig. III-4). The comparative yield of *Agropyron trachycaulum* was influenced the most by changes in moisture availability (Fig. III-4). Examples of performance by *Agropyron trachycaulum*, *Stipa curtiseta*, and *Stipa viridula* in dry and wet moisture regimes are illustrated in Plates III-1, III-2, and III-3, respectively.

The Yield Suppression Ratio also revealed a reduction in the relative above-ground biomass yield of the native grasses in the presence of *Bromus inermis* with increasing soil moisture, as compared to monocultures (Table III-3). This index indicated that the competitive abilities of the native grasses and *Bromus inermis* became more dissimilar with increasing soil moisture availability. The index of relative competitive intensity (see Methods 3.3.6) similarly showed that the amount of strain on the native grasses from competition with *Bromus inermis* was high within all treatments but generally showed a slight decrease (although considerably larger for *Agropyron trachycaulum*) with decreasing moisture availability (Table III-4). The effects of interspecific competition and moisture stress, as expressed by reductions in biomass yield, were additive (*sensu* Lockhart, 1965).

Table III-2. Summary of ANOVA results for above-ground biomass.[1]

Source of Variation[2]	DF	SS	MS	F	Pr>F
Species (S)	4	4.32	1.09	0.08	0.98
Treatment (T)	2	26.07	12.53	105.51	**0.0001**
Species*T	8	0.99	0.17	0.02	1.0
Competition (C)	1	64.50		195.52	**0.0002**
Species*C	4	1.32		0.05	0.99
S*C*T	8	1.55		1.59	0.44

1 - See methods section 3.3.6 for details.

2 - Source of Variation: S-Species, T-Treatment, C-Competition (Intraspecific vs. Interspecific); and interactions of the above

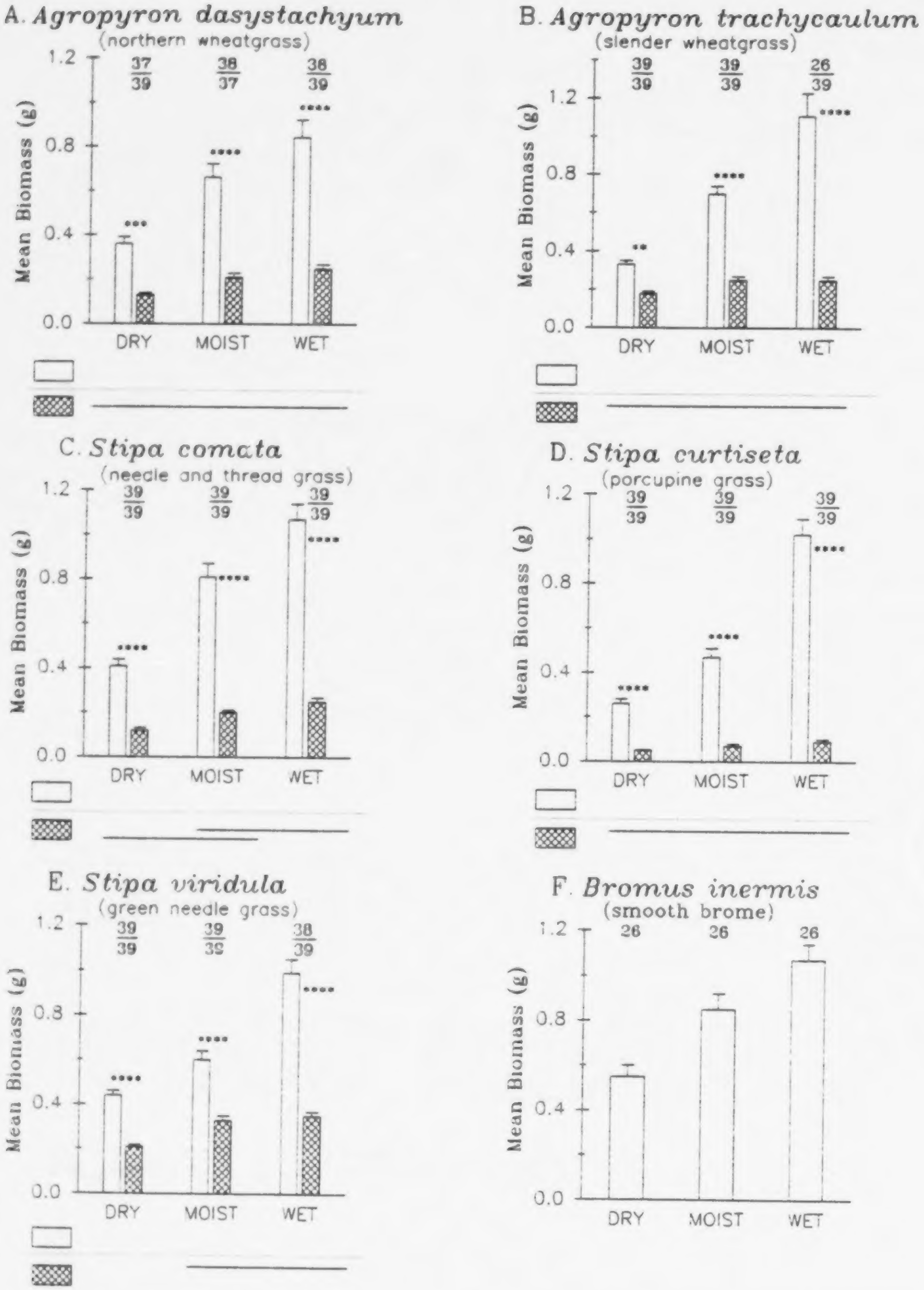


Fig. III−2. Mean and S.E.M. of individual above−ground biomass competing in monoculture or in mixturewith *Bromus i inermis* athree moisture levels. for 119−122 days. Significance levels for difference between intraspecific (☐) and interspecific (▨) are *=≤0.05, **=≤0.01, ***=≤0.001, ****=≤0.0001. Lines connect means which are not significantly different (least−squares means comparison). Numbers represent sample sizes for intraspecific (above) and interspecific (below) treatments. (Means and standard errors in Appendix 3−Table 1).

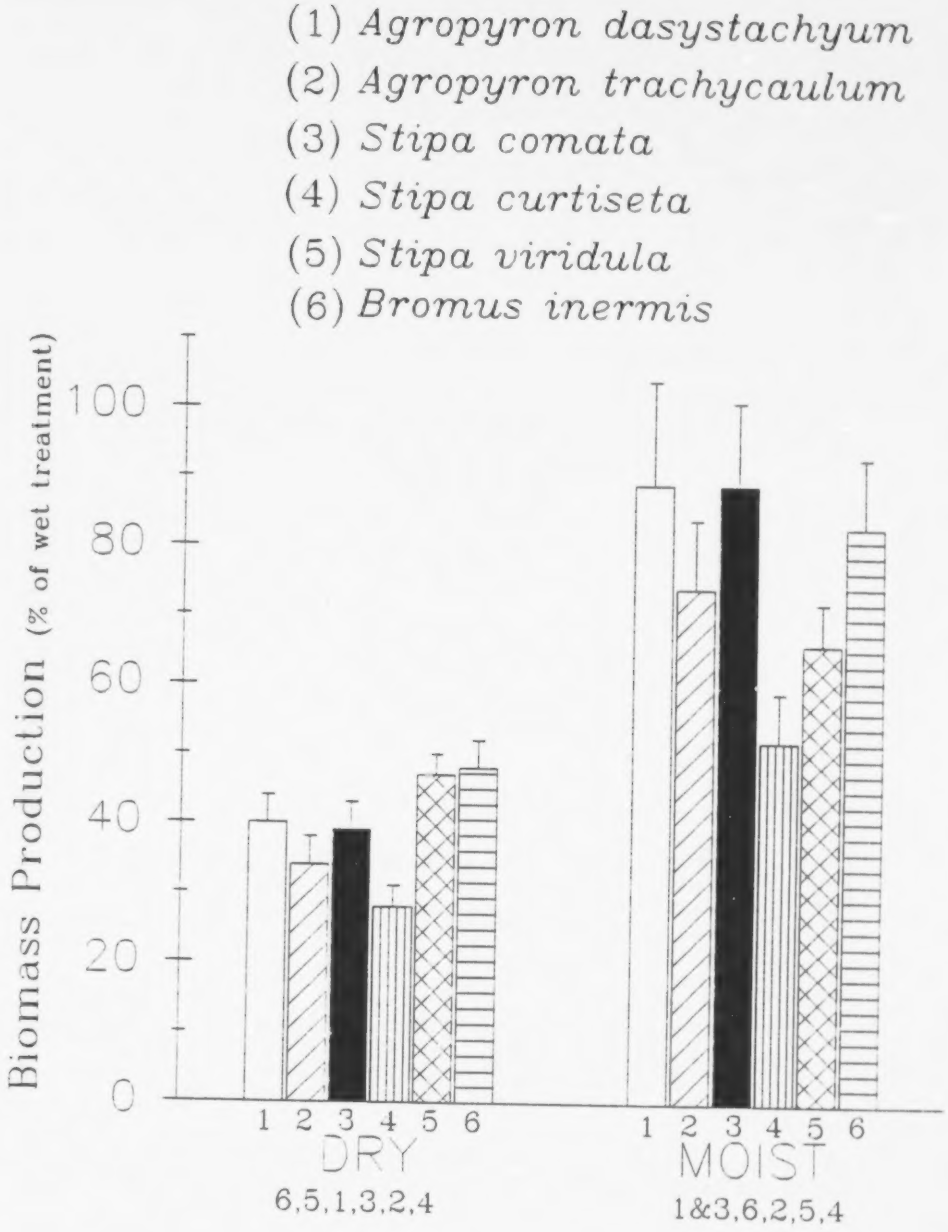


Fig. III-3. Biomass production of grasses competing intraspecifically under two levels of moisture stress after 119-122 days of growth. Growth is represented as a percentage of biomass production in the wet moisture treatment. Productivity hierarchy of species shown for each moisture treatment. Watering schedule of 6-8 weeks, 3-4 weeks and every week for the dry, moist, and wet moisture treatments, respectively. (Means and standard errors in Appendix 8-Table 2).

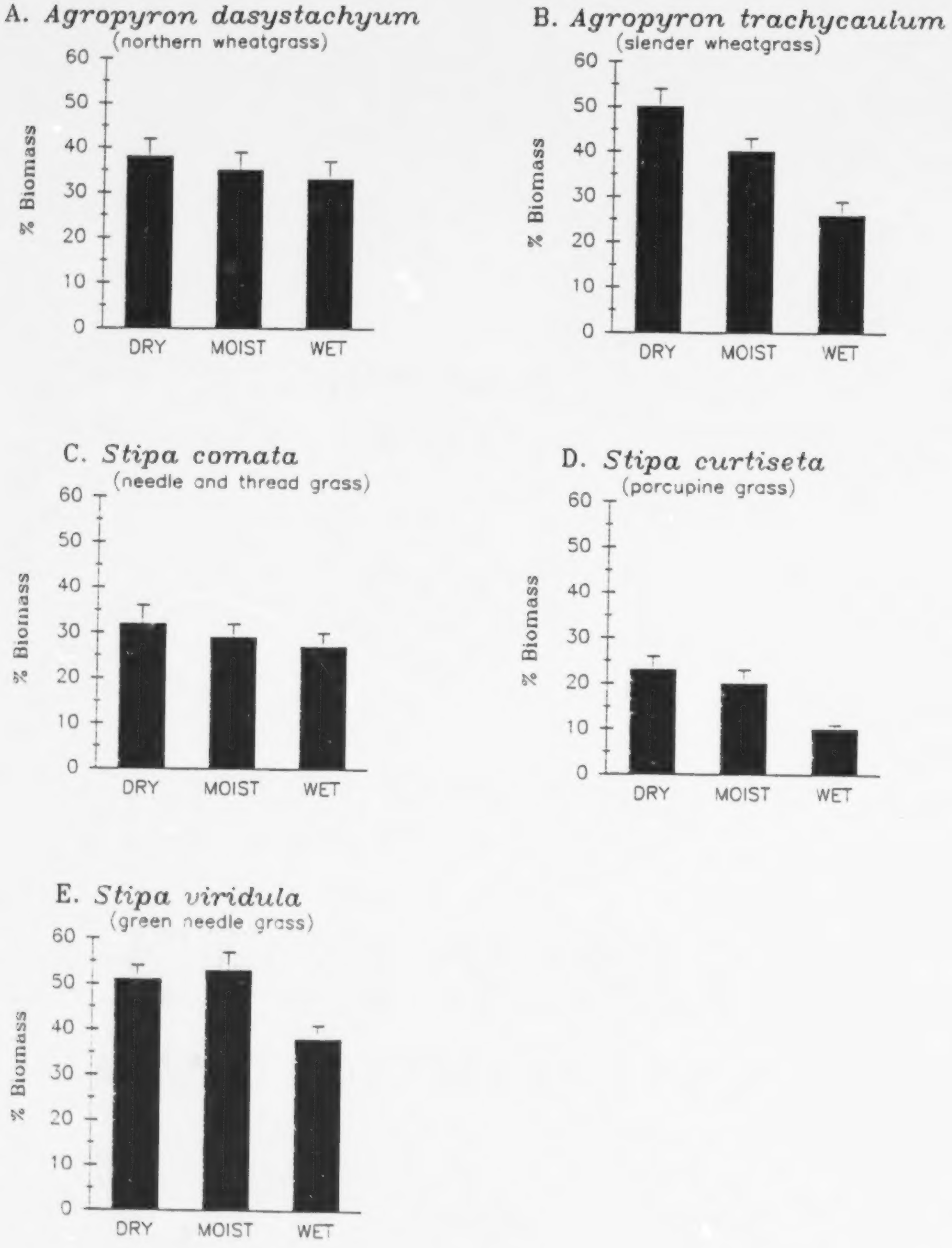
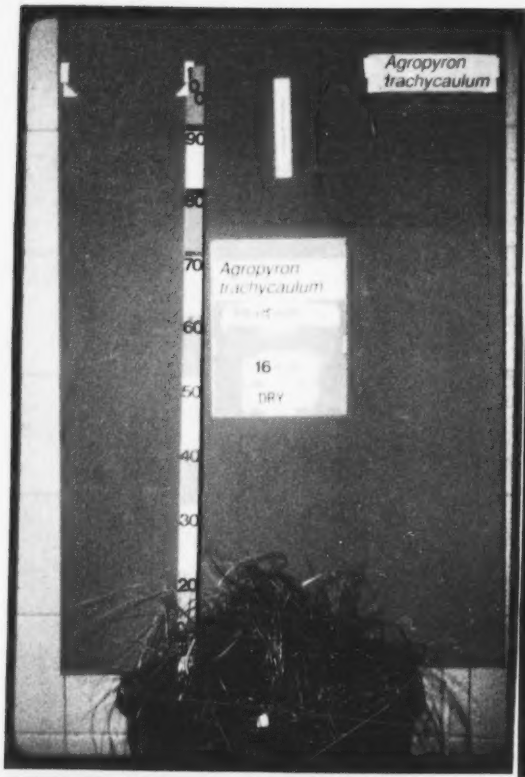
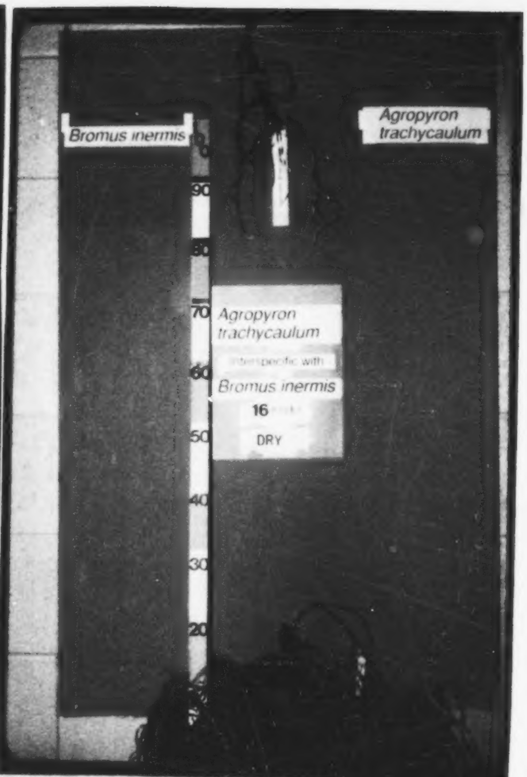


Fig. III–4. Biomass production of native grasses competing with *Bromus inermis* at three moisture levels for 119–122 days: represented as percentage of monoculture biomass. (Means and standard arrors in Appendix 8–Table 3).

Plate III-1. Growth of *Agropyron trachycaulum* after 16 weeks competing intraspecifically and interspecifically with *Bromus inermis* from dry and wet moisture regimes. Height markings in centimetres.


Agropyron trachycaulum
Agropyron trachycaulum
16
DRY
90
80
70
60
50
40
30
20


Bromus inermis
Agropyron trachycaulum
Agropyron trachycaulum
Interspecific with
Bromus inermis
16
DRY
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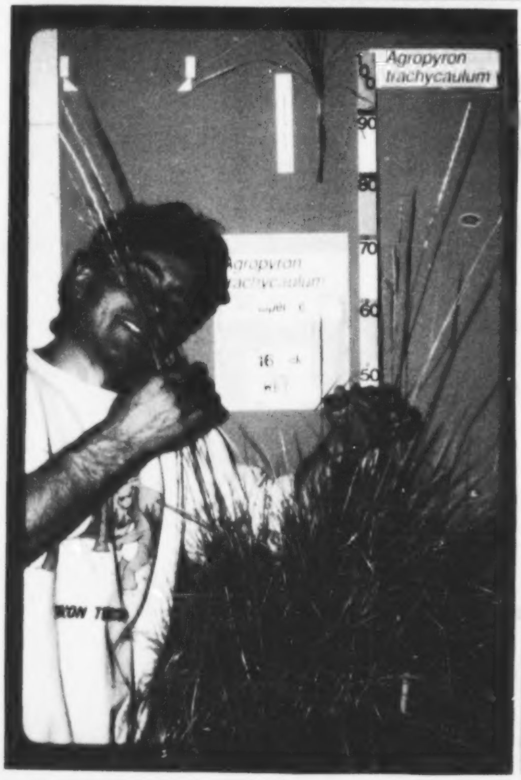
Agropyron trachycaulum
Agropyron trachycaulum
16
WET
90
80
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50

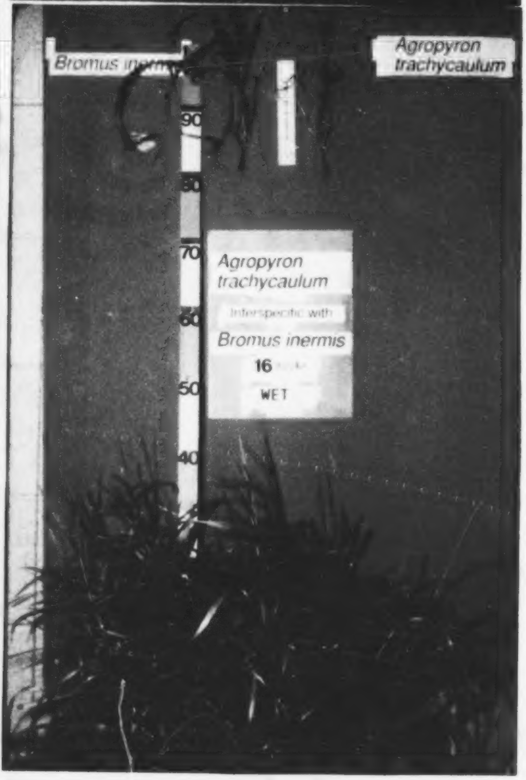
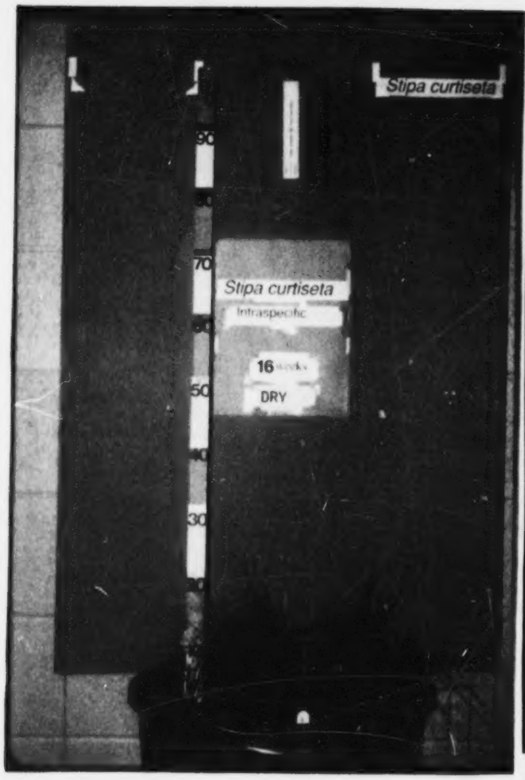
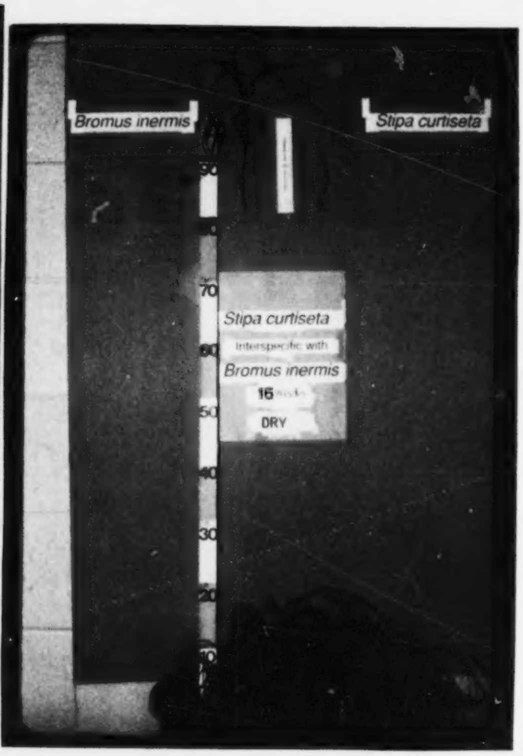
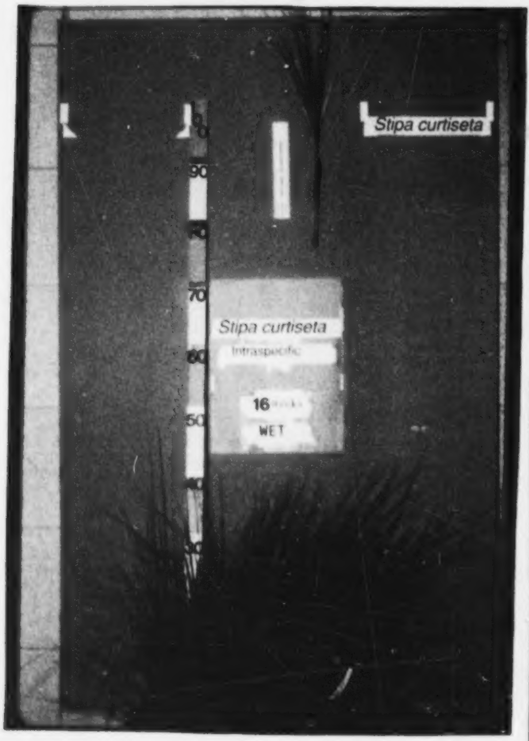

Bromus inermis
Agropyron trachycaulum
Agropyron trachycaulum
Interspecific with
Bromus inermis
16
WET
90
80
70
60
50
40

Plate III-2. Growth of *Stipa curtiseta* after 16 weeks competing intraspecifically and interspecifically with *Bromus inermis* from dry and wet moisture regimes. Height markings in centimetres.


Stipa curtiseta
Stipa curtiseta
Intraspecific
16 weeks
DRY
90
70
60
50
40
30
20


Bromus inermis
Stipa curtiseta
Stipa curtiseta
Interspecific with
Bromus inermis
16 weeks
DRY
90
70
60
50
40
30
20
10


Stipa curtiseta
Stipa curtiseta
Intraspecific
16 weeks
WET
90
70
60
50
40

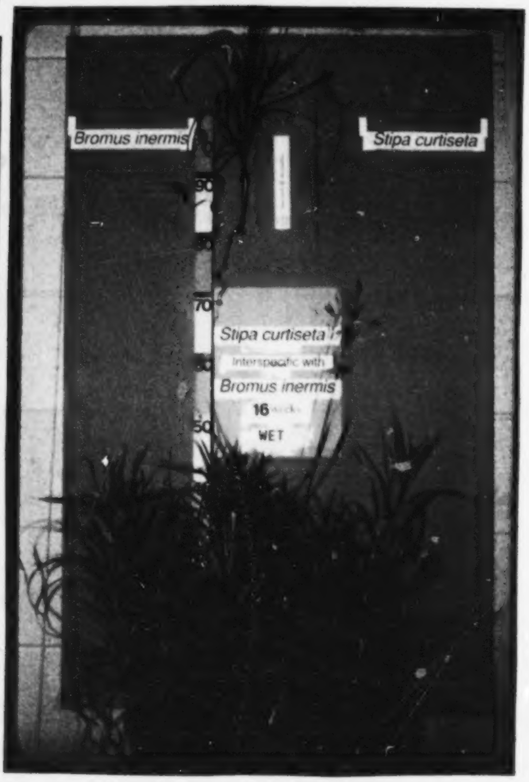
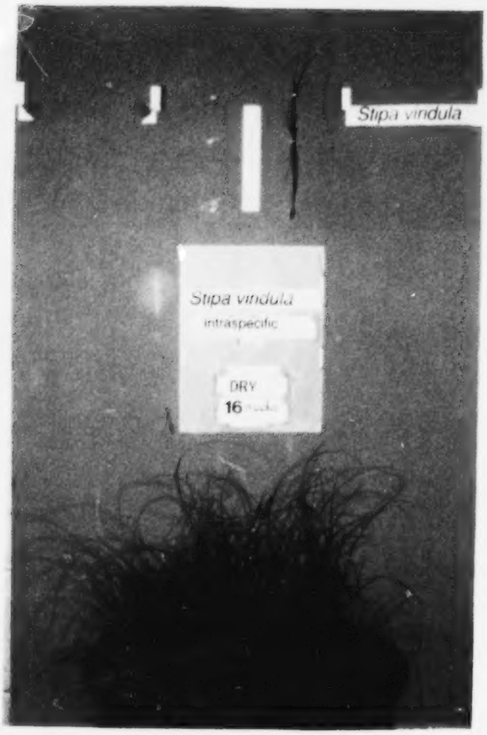
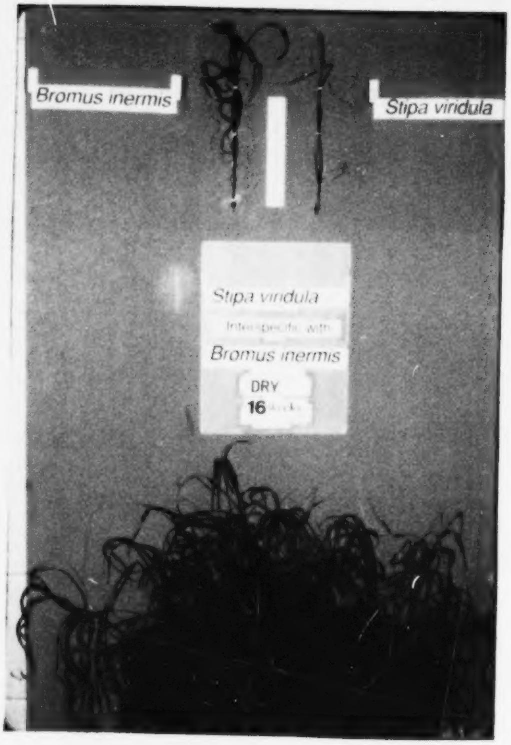
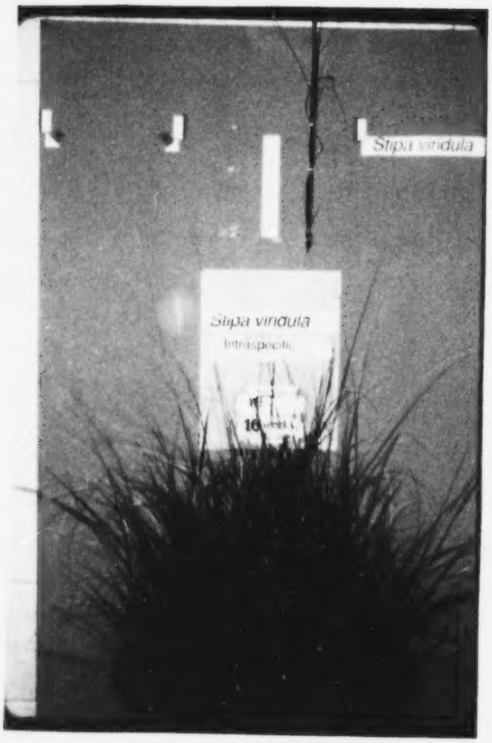

Bromus inermis
Stipa curtiseta
Stipa curtiseta
Interspecific with
Bromus inermis
16 weeks
WET
90
70
60
50

Plate III-3. Growth of *Stipa viridula* after 16 weeks competing intraspecifically and interspecifically with *Bromus inermis* from dry and wet moisture regimes.


Stipa viridula
Stipa viridula
intraspecific
DRY
16


Bromus inermis
Stipa viridula
Stipa viridula
Interspecific with
Bromus inermis
DRY
16


Stipa viridula
Stipa viridula
intraspecific
WET
16

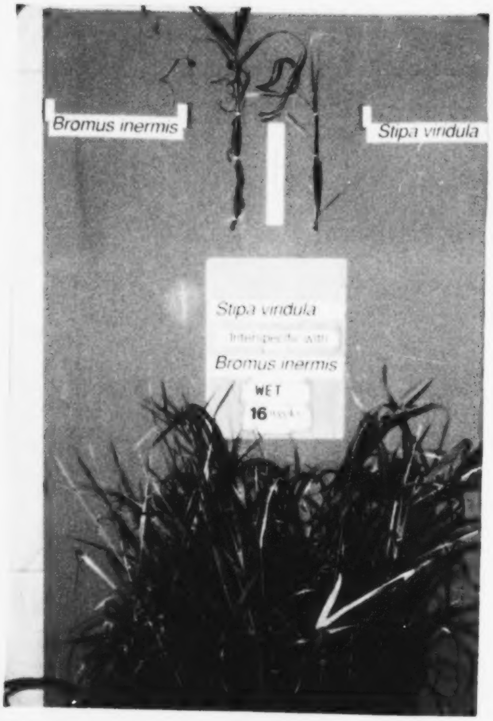

Bromus inermis
Stipa viridula
Stipa viridula
Interspecific with
Bromus inermis
WET
16

Table III-3. Yield Suppression Ratio[1] for performance of native grasses competing with Bromus inermis. Ratio determined from above-ground biomass[2] in mixed-culture and monoculture of each native species at three moisture levels.

Treatment	Species[3]				
	Agda	Agtr	Stco	Stcu	Stvi
DRY	.43±.03	.58±.03	.40±.10	.18±.02	.65±.06
MOIST	.31±.04	.33±.02	.18±.01	.14±.01	.62±.10
WET	.27±.01	.17±.02	.17±.01	.10±.03	.32±.01

[1] See Methods section 3.3.6 for details; a ratio of 1.0 indicates that the competitive abilities of the two species are equivalent, while a value approaching 0 reflects greater dissimilarity in competitive abilities.

[2] Sample size between 37 and 39, except for Agropyron trachycaulum in the wet treatment which had a sample size of 26.

[3] Species abbreviations are Agda-Agropyron dasystachyum, Agtr-Agropyron trachycaulum, Stco-Stipa comata, Stcu-Stipa curtiseta, Stvi-Stipa viridula.

Table III-4. Index of Relative Competition Intensity.*

Species	Interspecific Competition			Moisture Stress	
	Dry	Moist	Wet	Intra	Inter
Agropyron dasystachyum	.62±.04	.65±.04	.67±.04	.60±.04	.52±.04
A. trachycaulum	.50±.04	.60±.03	.74±.03	.66±.04	.42±.04
Stipa comata	.68±.04	.71±.03	.73±.03	.61±.04	.54±.05
S. curtiseta	.77±.03	.80±.03	.90±.01	.72±.03	.55±.04
S. viridula	.49±.03	.47±.04	.62±.03	.53±.03	.41±.03

* - See Methods section 3.3.6. for details; an index value of 0 indicates that there is no competition. A value approaching 1 indicates an increasing competitive influence of *Bromus inermis* on the native species.

A possible room effect was observed in 5 out of 33 pairwise comparisons, within species and treatments, of mean individual biomass per pot in mixed-cultures within a room and between rooms.

3.4.4. Competitive Hierarchy

The competitive ability of the native grasses with *Bromus inermis* greatly differed among species and varied with moisture availability (Fig. III-5). *Stipa viridula* exhibited the greatest overall competitive ability while *S. curtiseta* was the poorest competitor. *Agropyron trachycaulum* showed a competitive reversal by being a better competitor under dry conditions, less competitive under moist conditions, and one of the poorest competitors in the wet treatment. The competitive performance among species determined by the Yield Suppression Ratio suggested the same competitive hierarchy (Table III-3).

3.4.5. Competitive Influence of Native Grasses on *Bromus inermis*

Bromus inermis attained greater average individual above-ground biomass in competition with each native grass species, as compared to monoculture, under all moisture regimes (Fig. III-6). The Yield Suppression Ratio revealed an unbalanced competitive match between *Bromus inermis* and all the native species (Table III-3). The index also shows that the competitive influence of the native species on *Bromus inermis* increased with decreasing moisture availability.

As observed with the native grasses in monoculture, the above-ground biomass of *Bromus inermis* increased with increasing moisture availability (Fig. III-2 and 6). Unlike the native grasses, this trend was also significant with interspecific competition, except between the moist and wet treatments in the presence of *Stipa comata* (LSM, Fig. III-6). The proportional yield of *Bromus inermis* competing with each native species, compared to its monoculture, increased with increasing moisture availability (Fig. III-7). The exceptions were peak production in the moist treatment with *Stipa comata* and *S. viridula*. This trend was opposite to that observed for the native grasses (Fig. III-4).

The above-ground interspecific growth performance of *Bromus inermis* revealed differences in competitive ability among the native competitors at all three moisture levels (Fig. III-8), as was observed from the competitive influence of *Bromus inermis* on the native grasses (Fig. III-5). The biomass attained by *B. inermis* when competing with the native grasses indicated that *Stipa viridula* was not always the best competitor (Fig. III-8). *S. viridula* had a relatively greater competitive effect on *Bromus inermis* above-ground biomass production than the other grasses in the wet treatment and a slightly greater influence in the dry treatment; in the moist treatment, however, it appeared to be competitively similar to the two *Agropyron* species.

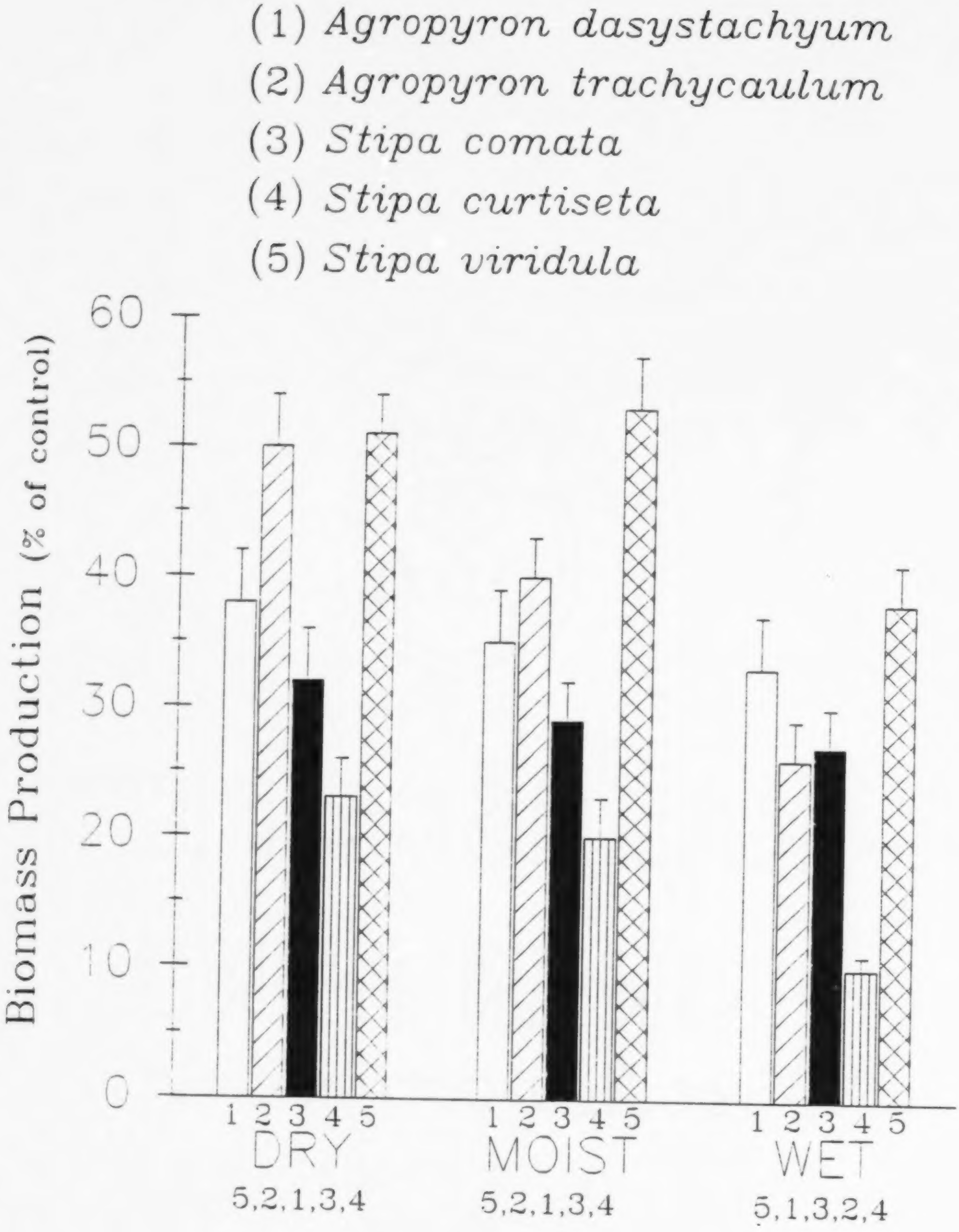


Fig. III-5. Biomass production of native grasses competing with *Bromus inermis* at three moisture levels for 119-122 days. Growth represented as a percentage of their biomass production in monoculture controls. Hierarchies of species competitive ability with *Bromus inermis* are shown for each moisture treatment. (Means and standard errors in Appendix 8-Table 3).

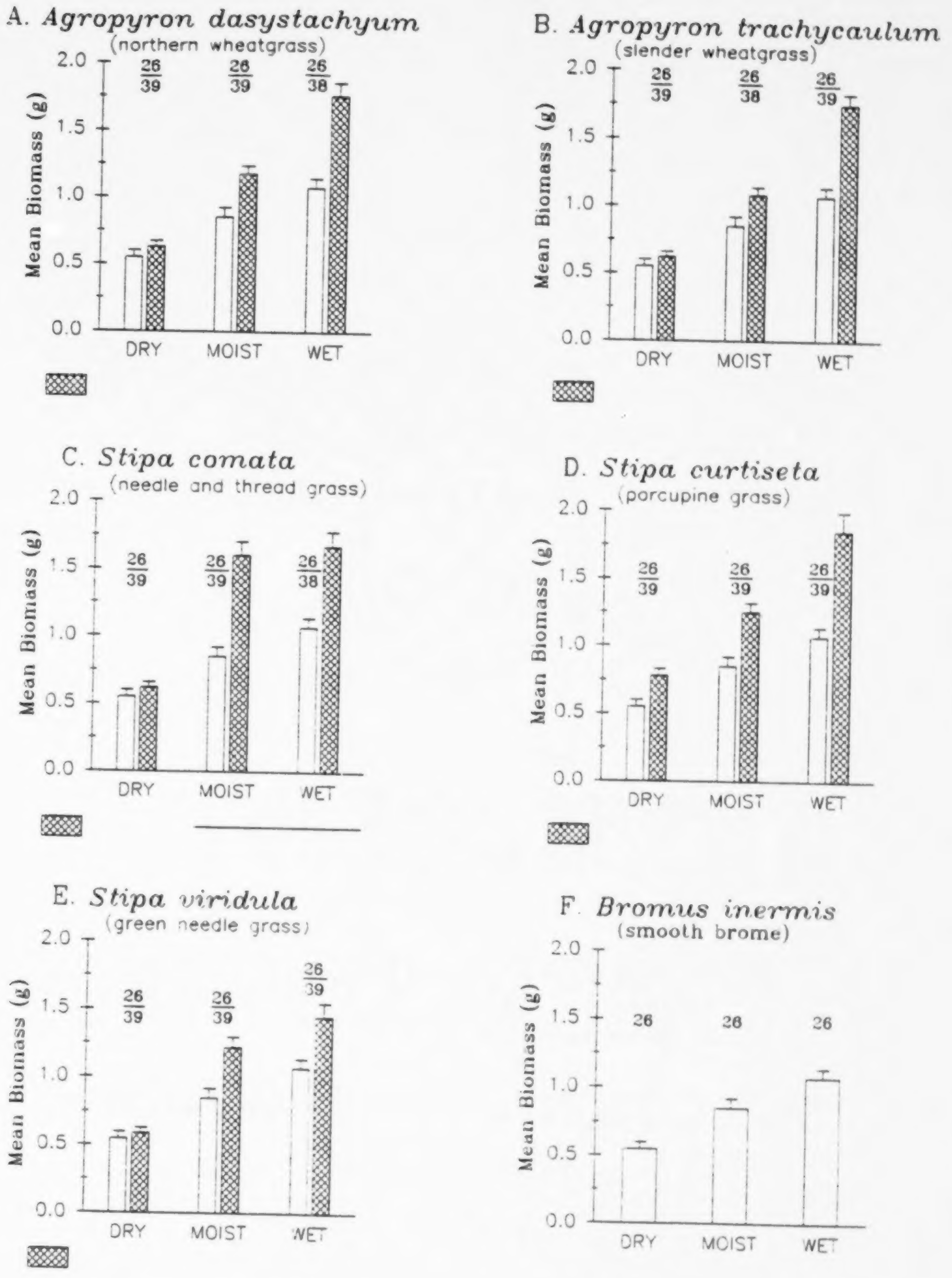


Fig. III−6. Mean and S.E.M. of individual above−ground biomass of *Bromus inermis* competing in monoculture (□) or in mixture (▨) with each native grass species at three moisture levels after 119−122 days of growth. Lines connect means which are not significantly different (least−squares means comparison). Differences between moisture levels for monoculture samples *were* significant for all species. Numbers are sample sizes for intraspecific (above) and interspecific (below) interactions. (Means and standard errors in Appendix 8−Table 4).

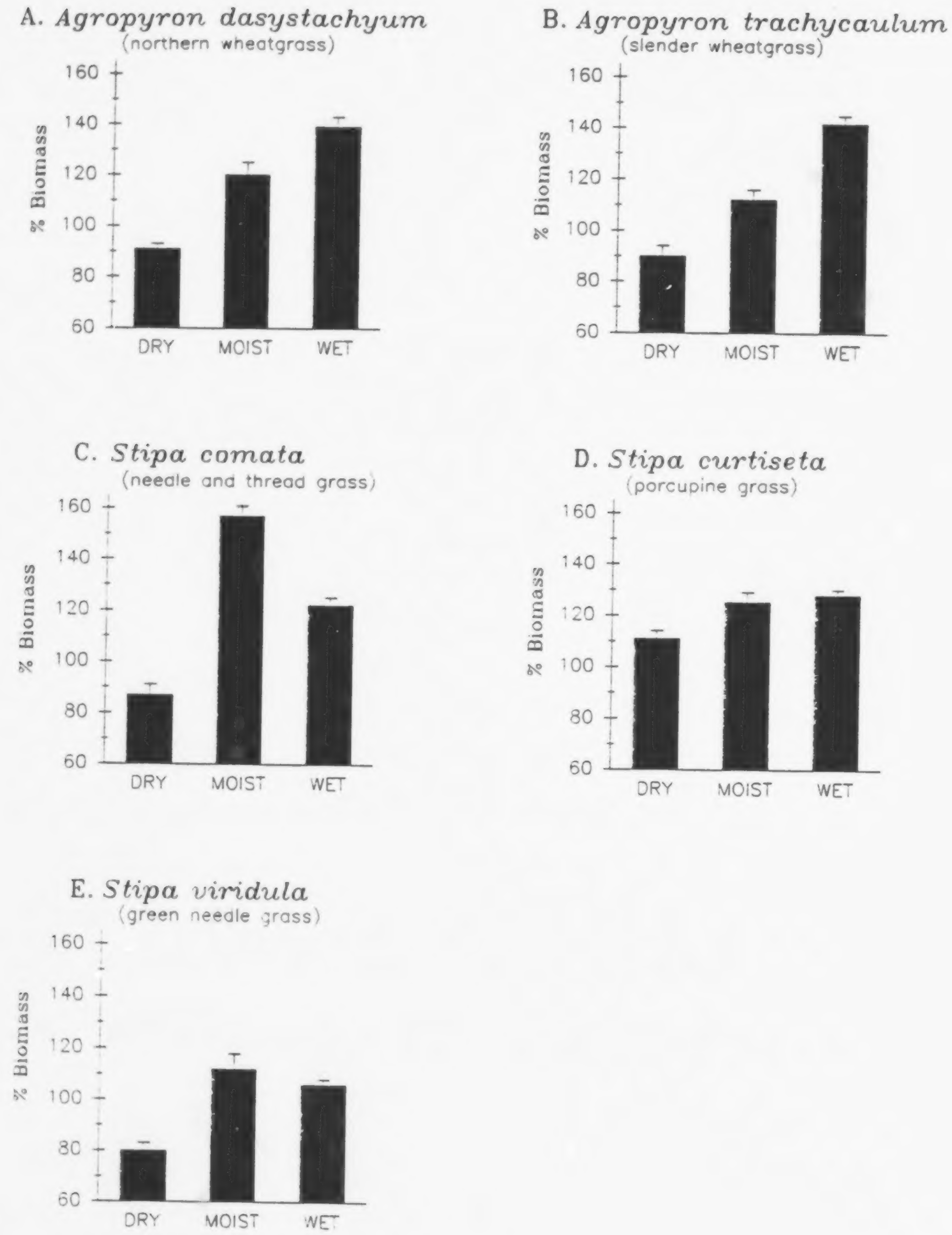


Fig. III–7. Biomass production of ***Bromus inermis*** competing with native grass species at three moisture levels for 119–122 days: represented as percentage of monoculture biomass. (Means and standard errors in Appendix 8 – Table 5).

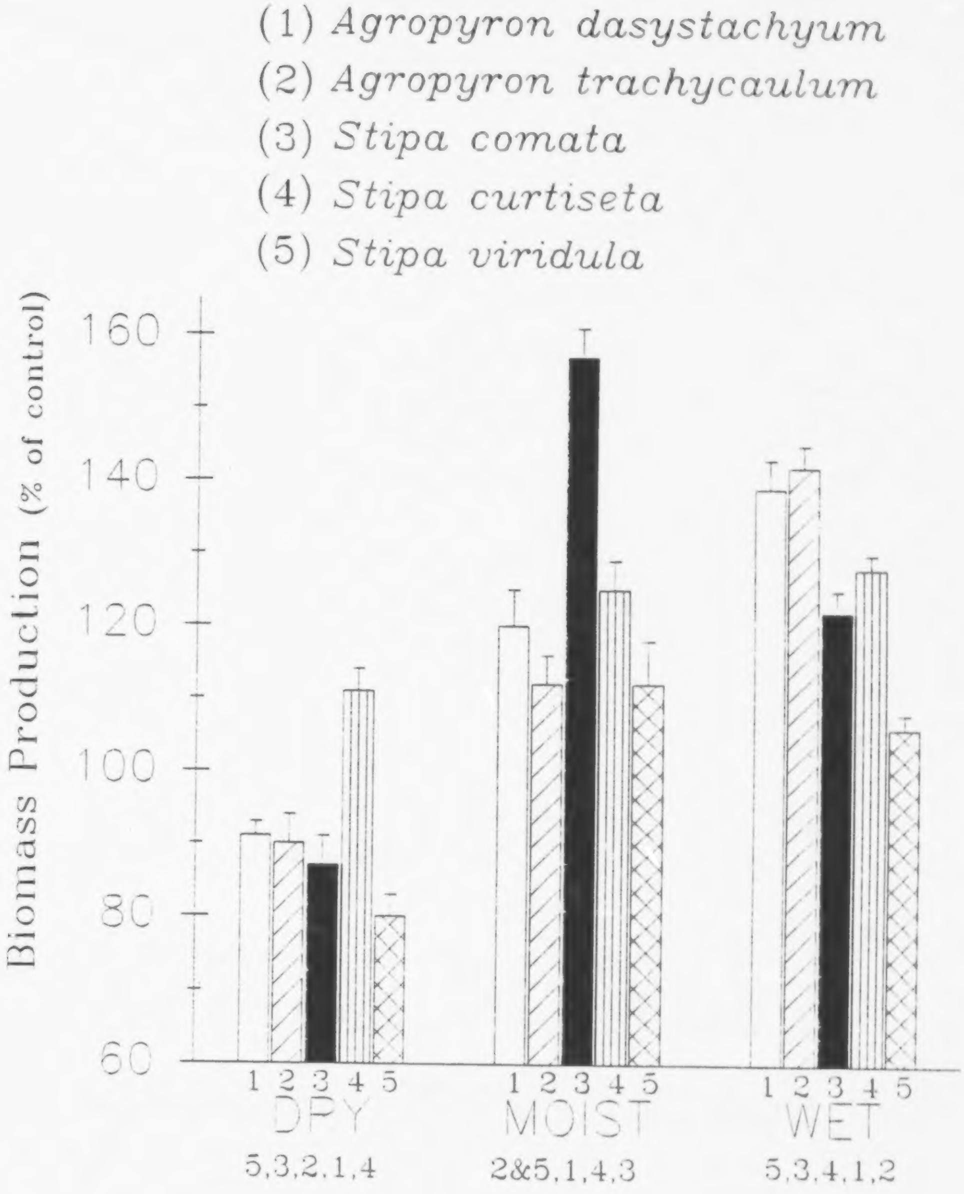


Fig. III–8. Biomass production of ***Bromus inermis*** competing with each native grass species at three moisture levels after 119–122 days of growth. Growth is represented as a percentage of its biomass production in monoculture controls. Hierarchies of species competitive influence on ***Bromus inermis*** are shown for each moisture treatment. (Means and standard errors in Appendix 8–Table 5).

The interspecific above-ground growth performance of *Bromus inermis* did not suggest that *Stipa curtiseta* was as poor a competitor as evident from the comparative performance of *S. curtiseta*. The native grasses generally had a less differential influence on the biomass attained by *Bromus inermis,* regardless of species (Fig. III-8), than did *B. inermis* upon their growth (Fig. III-5). The exceptions to this generalization are the effects of *Stipa curtiseta* in the dry treatment and *S. comata* in the moist treatment.

3.5. DISCUSSION

The experiments were designed to elucidate the relative competitive abilities of five grass species from the northern mixed-grass prairie of south-central Saskatchewan, based on their interactions with *Bromus inermis*, an invasive exotic, along a moisture gradient.

3.5.1. Soil Moisture

The gravimetric soil moisture measurements verified substantial differences in soil moisture content among the three moisture treatments (Table III-1). The fluctuation over the experimental period in soil moisture measured prior to scheduled watering may have been a response to variations in the ambient relative humidity. This is suggested by the synchronized variability in both growth rooms and across moisture treatments. The sample size used to determine the average percent dry weight moisture content differed between moisture treatments because of the number of pots sampled and the number of weighing measurements taken for each moisture treatment. The sample size was particularly limited in the dry treatment because there were only two weighing periods and the data from one of the sample pots were not used due to uncorrectable errors.

3.5.2. Water Stress

Moisture limitation usually has multiple effects on plant growth, including reduced cell turgor and photosynthesis; both of which have concomitant negative effects on plant growth compared to unstressed plants (Kramer, 1969). Water stress has been shown to reduce shoot biomass production (Majerus, 1975; Ewing and Menke, 1983; Thomas, 1984; Knapp, 1984; Reekie and Redmann, 1991) and root development in a number of grasses (Majerus, 1975; Fulbright et al., 1984; Johnson and Aguirre, 1991). Reduced shoot growth under moisture limitation may have resulted from greater allocation of biomass to the root system to obtain the limiting resource. Although moisture stress has been shown to have no effect on the partitioning of above- and below-ground biomass in some grasses (Alcocer-Ruthling et al., 1989), changes in rooting depth and structure correlated with soil moisture status implies shifts in root:shoot ratios along moisture gradients (Clements and Weaver, 1924; Coupland and Johnson, 1965). Decreasing moisture availability undoubtedly stressed both root and shoot growth. The effect of water stress on above-ground growth could have been a response to nutrient limitation because soil moisture content can influence ion mobility and thus the availability of nutrients (Allen, 1982), particularly nitrogen (Lauenroth and Dodd, 1978; Tilman, 1990b). Nutrient deficiencies were not monitored or observed during the experiment.

How water stress affected the native grasses and their competitive traits is unknown, although some observations were made. The effects measured were the lower total above-ground growth of monocultures in the dry and moist treatments compared to the wet (Fig. III-3), and lower interspecific above-ground growth compared to monoculture (Fig. III-5).

3.5.3. Competitive Performance and Hierarchy

Above-ground dry weight was used as an indicator of species competitive performance because it has been found to be a good measure of competitive ability (Smoliak and Johnston, 1975; Roush and Radosevich, 1985; Sangakkara and Roberts, 1987; Gaudet and Keddy, 1988), but it may not always be the best indicator (Frankow-Lindberg, 1985). Seedling dry weight of *Panicum maximum* (green panic grass) accounted for 80% of the variance in plant height (Cook and Ratcliff, 1984) suggesting that above-ground biomass may be a better indicator of competitive ability for light than of total competitive ability, above- and below-ground.

The results demonstrate that *Bromus inermis* was (1) the least affected by water stress based on its relative growth in the dry monoculture treatment (Fig. III-3) and (2) the superior competitor at all moisture levels tested (Fig. III-2). Personal observations at LML NWA and other locations throughout the prairies during the drought of the late 80's and the cool-wet early 90's indicate that *B. inermis* is a formidable competitor. When moisture availability is adequate to high, this exotic spreads rapidly from roadside ditches and established clonal islands through unbroken native prairie by rhizomatous vegetative propagation. Few, if any, native species persist once *B. inermis* has completely invaded.

Experimental additions of water removed growth restrictions on *Bromus inermis*, thus introducing greater competitive stress through shading. The native grasses performed better under abiotic stress imposed by drought than under low light stress imposed by the biotic interaction with *Bromus inermis*, as revealed by the comparative yield (Fig. III-4) and Yield Suppression Ratio (Table III-3). The competitive hierarchy of the native grasses identified *Stipa viridula* as a good competitor, *S. curtiseta* as a consistently poor competitor, and a competitive reversal in *Agropyron trachycaulum* which shifted from a good competitor in the dry treatment to a poor one in the wet treatment (Fig. III-5). The small number of competitive reversals revealed experimentally could have been exacerbated by the unnatural environment including a limited soil depth and the method of watering. The significant results may not be completely indicative of what would occur in a natural prairie community.

The assumptions which have been stated must be made for the creation of competitive hierarchies are; (1) there are consistent hierarchies of relative species abundance in the field, (2) the relative competitive abilities among species are transitive, and (3) there is a correlation between a species' rank abundance in the field and its competitive rank in experiments (Silvertown and Dale, 1991).

Although the species studied here often exhibit zonation along moisture gradients in the field (pers. obs., S. Sask.), transitivity among these species' competitive abilities cannot be positively inferred from this experiment because the competitive hierarchy was established with a phytometer and not by direct pairwise interactions. The identity of the phytometer may be relevant because the competitive outcome between a stress-tolerant and a productive species could be very different from that between species with similar growth traits. By experimenting over a resource gradient, differences in growth traits of competitors should produce changes in the competitive outcome along the gradient. Aarssen (1988) found that a change in the identity (or even genotype) of a phytometer created some intransitivity in the competitive hierarchy among four pasture species. It has been suggested, however, that the performance of multi-species mixtures can be predicted from monoculture performance (Austin and Smith, 1989) and that the competitive hierarchy established with a phytometer does provide a transitive competitive rank among species because the competitive outcome is not changed by the identity of the phytometer (Gaudet and Keddy, 1988).

In the present study, the phytometer-based competitive rank of the grasses does not always correlate with the rank abundance of these species along a moisture gradient in the field (pers. obs., S. Sask.). The poor performance of the drought-tolerant grasses (*Stipa comata* and *S. curtiseta*) competing with *Bromus inermis* in the dry treatment may have been caused by the watering method. Thorough watering of the entire soil volume, which was insufficient for adequate root stratification, did not replicate the natural light prairie precipitation events which may benefit the shallow-rooted *Stipa* species. Meanwhile, the superior performance of *Agropyron trachycaulum* with *Bromus inermis* in the dry regime may reflect its status as a stress tolerator; but it too, as a deeper-rooted species, would, I suspect, succumb to moisture stress if competing with the shallow-rooted, drought-tolerant *Stipa* species in a dry prairie. Rabinowitz et al., (1984), Sangakkara and Roberts (1985), and Aarssen (1988) all found that rank abundance in the field and experimental competitive rank are not always correlated.

The measurement of diffuse competition, by comparing growth of isolated individuals with those surrounded by other associated species, may be a more appropriate method than pairwise experiments for determining species' competitive ability in a community and along an environmental gradient (Wilson and Keddy, 1986b). In light of my inability to satisfy fully the speculated assumptions listed previously for the creation of competitive hierarchies, this study's suggested competitive hierarchies among the five native grass species should be accepted for what they are - the rank orders of their competitive ability with *Bromus inermis* along a moisture gradient - and as predictions of the possible competitive hierarchy among them in different moisture regimes in the field.

3.5.4. Morphological and Physiological Interpretation of Competitive Outcome

Differences in morphological and physiological attributes have been linked to competitive ability (Aarssen, 1989) and found to explain the transitive competitive hierarchy among species competing for water (Roush and Radosevich, 1985). Seedling emergence time, and inherent differences in initial seedling size, could confer a competitive advantage (Harper, 1977; Goldberg, 1987; Epp and Aarssen, 1989), although they also have been found to be of no significance in some cases (Sangakkara and Roberts, 1986; Wilson, 1988a). To avoid an initial size advantage in this experiment, equal-aged seedlings with equal-sized cotyledon were planted. Leaf area and plant height are other attributes which can confer competitive advantages (Smoliak and Johnston, 1975; Epp and Aarssen, 1989) and may be correlated with seed size (Rhodes, 1968; Sangakkara and Roberts, 1986; Aarssen, 1989; Epp and Aarssen, 1989) and shoot growth rate (Sangakkara and Roberts, 1986; Eissenstat and Caldwell, 1987; Sangakkara and Roberts, 1987; Aarssen, 1989; Epp and Aarssen, 1989); which are major characteristics conferring competitive ability. Although seed size and shoot growth rates were not measured, personal observations revealed that *Bromus inermis* had the largest seeds (ca. 7.5 to 9 mm), grew the tallest, and was the first species to react to moisture stress, by wilting and drying, and to increased water supply, by flushing new leaves.

Differences in seed size and shoot growth rate can lead to increasing differences in plant size and the possibility of resource pre-emption by the larger plant (Wilson, 1988a). Observed seed sizes of the native grasses generally differed among species, and did not correlate with comparative competitive ability. *Stipa comata* and *S. curtiseta*, which are apparently drought-tolerant grasses based on field observations, performed worst in competition with *Bromus inermis*. The other, faster-growing, wider-leaved species, which inhabit more mesic sites, performed better. Stress-tolerant species are adapted to resource limitations and have inherently slow growth rates (Chapin, 1980). Thus the slower growth, smaller size, and thinner leaves would put the stress-tolerant species at a disadvantage when the growth of other, more productive grasses, is not suppressed by some limiting factor.

The better competitive ability of the mesophytic grasses with *Bromus inermis* may be related to their similarity in size and growth form. Competition for a resource is usually greater when individuals or species are more similar in morphological and growth traits (Frankow-Lindberg, 1985; Goldberg, 1987). Thus relative stature, during growth and at maturity, may be responsible for the differences in the competitive outcome between the stress tolerators and more productive grasses. Plant height, however, did not confer an advantage to *Agropyron trachycaulum* along the moisture gradient as its competitive performance with *Bromus inermis* was adversely affected by increasing moisture availability compared to monoculture (Fig. III-4). Moreover, the competitive performance of *Agropyron dasystachyum*, which is a shorter grass, was not greatly influenced by the change in moisture availability (Fig. III-4).

Agropyron trachycaulum is an alkali-tolerant grass and thus should be adapted to osmotic stress. If *A. trachycaulum* is a stress-tolerant species, this might explain why it performs well under abiotic stress, whether osmotic or moisture, but competed poorly under greater biotic stress (i.e. with *Bromus inermis* in the wet treatment). Although *A. trachycaulum* is adapted to different stress factors and maintains a different growth rate than *Stipa comata* and *S. curtiseta*, these three species, as stress tolerators, may have similar competitive abilities. Stress-tolerant species have many similar physiological characteristics suggesting an evolved adaptive strategy with comparable competitive abilities to withstand stress (Chapin, 1980). The results of this study confirm that the response to competition is species-specific and that the effect of a particular competitor could be a function of its size and morphology (Goldberg, 1987; Fowler, 1990).

Although root and shoot competition were not separated in this study, increasing equality in above-ground growth performance, between the native grasses and the exotic competitor, with decreasing moisture availability suggests that below-ground competition was more important in the dry treatment (Table III-3). Furthermore, the imbalance in above-ground growth between the native and exotic competitors indicated competitive asymmetry in all moister regimes. In a review of 47 shoot and root competition experiments, Wilson (1988b) demonstrated that root competition usually was more intense and had a greater influence than shoot competition in 70% of the experiments. The importance of root competition, whether for water or some other soil resource, was evident early in the experimental period, before individual plant crowns were touching, from the observed height differences of the native species between intraspecific and interspecific groups (pers. obs.). The rank order of species shoot biomass production in the dry treatment relative to the wet monocultures (i.e. abiotic stress) was identical to the rank order for competitive performance with *Bromus inermis* in the wet treatment (i.e.

biotic stress) (Fig. III-9). This suggests that (1) the native grasses responded similarly to abiotic and biotic stress, and (2) the interaction between *B. inermis* and the native grasses was largely below-ground root competition for the moisture resource, compounded by above-ground competition when soil moisture was not limiting. *B. inermis* has been found to be a significantly better competitor than seven other prairie species (Goldberg, 1987), to use more water (Van Riper, 1964), and to have a greater competitive ability for water (Groya and Sheaffer, 1981) than a number of other grasses. Prairie grasses with the greatest soil water extraction capabilities were found to be the superior competitors (Harris, 1967; Eissenstat and Caldwell, 1988; Reichenberger and Pyke, 1990).

3.5.5. Expression of Competitive Ability along a Resource Gradient

Interspecific competition was evident in each of the moisture regimes (Fig. III-2). Furthermore, both the mechanism and the intensity of competition appeared to change along the resource gradient. When soil moisture is not limiting, competition above-ground becomes more apparent and species attributes such as growth rate and plant height confer a greater advantage in competitive ability for other resources, including light. Small initial differences in height should have significant effects on the competitive outcome because the quality and availability of light attenuates exponentially with distance below the top of the canopy (Keddy and Shipley, 1989) and resource pre-emption would create greater competitive asymmetry. Plant traits related to size are known to confer competitive ability when soil resources are not limiting (Gaudet and Keddy, 1988), although these size-related attributes and resource pre-emption are more important when competing for light than for other resources (Wilson, 1988a).

When soil moisture is limiting, the above-ground attributes which confer dominance to the 'competitive' species become less important compared to below-ground interactions. Under moisture limitation, the adaptive attributes of stress-tolerant species can provide a competitive advantage. For example, shallowly-rooted species such as *Stipa comata* and *S. curtiseta* capture more moisture from brief light showers compared with other more deeply-rooted 'competitive' species (Potvin, 1984). The more competitive productive species often exhibit deficiency symptoms and increased susceptibility to other stresses under resource limitation (Chapin, 1980). Stress-tolerant species, however, can survive and maintain growth longer over periods of extremely low soil resource availability and thus outproduce the competitive species over time (Chapin, 1980). The adaptive attributes of stress-tolerant species, such as the shallow-rooting and slow growth rate of *Stipa comata* and *S. curtiseta* and the salt tolerance of *Agropyron trachycaulum*, when expressed under productive (non-stressful) conditions are not capable of providing a competitive advantage over the analogous attributes of the competitive species which are no longer suppressed.

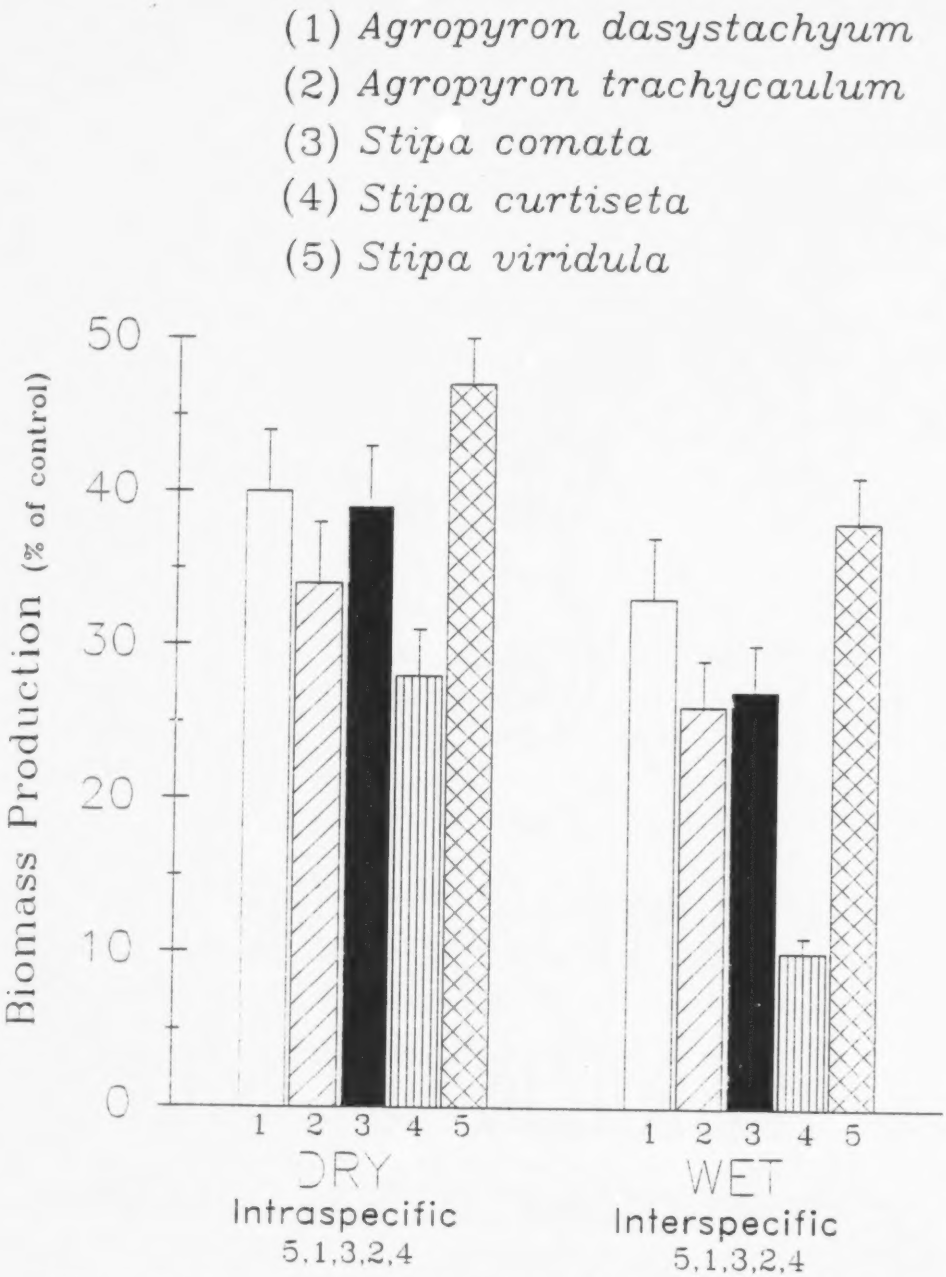


Fig. III–9. Biomass production of native grasses competing intraspecifically in dry moisture regime (percentage of monocultures in wet moisture treatment) compared with their biomass production competing interspecifically with *Bromus inermis* in wet moisture regime (percentage of monocultures in wet moisture regime) after 119–122 days of growth. Hierarchies show relative ability to tolerate stress for both abiotic and biotic stress situations. (Means and standard errors in Appendix 8–Table 2 and 3 for the dry and wet treatments, respectively).

The index of relative competition intensity indicates that competitive intensity was higher at the high-resource end of the gradient, i.e. interspecific competition had a greater influence than moisture stress in most cases (Table III-4). I believe that "influence" is a more appropriate term for this index than "intensity" which suggests the mechanistic intensity of competition. For example, the index indicates that intensity of competition was greater between species with dissimilar competitive abilities (*Stipa curtiseta* and *Bromus inermis*) than between those which are more similar (*S. viridula* and *B. inermis*) (Table III-4). The reverse of this index appears to relate more closely to mechanistic competitive intensity, i.e. an increasing index value would imply decreasing mechanistic intensity of interspecific competition. This interpretation of the index is valid because (1) greater competitive intensity (Goldberg, 1990; Fowler, 1990) and predominance of root competition at low soil resource levels and (2) increased shoot competition and greater competitive imbalance at high soil resource levels (Wilson, 1988b) have been inferred from studies of competition among prairie grasses along soil nitrogen gradients (Wilson and Tilman, 1991; Tilman and Wedin, 1991) and suggested as trade-offs in maximal growth along resource gradients (Tilman, 1990a).

Vegetation zonation patterns indicate that many species attributes (e.g. seed weight, seedling emergence time, plant height, lateral spread, and growth rate) that enhance competitive ability may be expressed in different stages of succession; the expression of these competitive traits being influenced by local gradients (Epp and Aarssen, 1989). The continuum concept of vegetation states that the physiological mechanism and type of competition (exploitative or interference) will vary with position along direct (e.g. air temperature and soil pH) and resource gradients (Austin and Smith, 1989) and that this variability will affect the rank order of competitive hierarchies (Wilson and Keddy, 1986a). Thus the suppression or expression of competitive traits along abiotic gradients will determine species competitive ability, influence species distribution patterns, and ultimately control vegetation community development along these gradients. These resource-dependent competitive reversals have been suggested as the mechanism for preventing competitive exclusion because of differences in resource levels among microhabitats (Aarssen, 1989).

3.5.6. 'Trade-offs' in Competitive Ability along a Resource Gradient

It appears that some competitive attributes (e.g. growth rate and size) of productive species are suppressed under resource limitations, making them inferior to stress tolerators; in high resource sites, however, these attributes confer a competitive advantage. It is not known if trade-offs were made in biomass allocation between above- and below-ground competitive ability in this study. However, trade-offs may prevent stable transitive competitive hierarchies (transitivity being the exact relationship between A and B, and B and C transferred to the relationship between A and C) from forming and explain competitive reversals along resource gradients (Keddy and Shipley, 1989). In one study, trade-offs were not found between above- and below-ground competitive ability along experimental light and nutrient gradients which could have explained species field distribution patterns (Campbell et al., 1991). In another, trade-offs in biomass and nitrogen allocation to leaves, roots, stems, and reproduction were evident along a 60 year chronosequence of secondary succession (Gleeson and Tilman, 1990).

Although only above-ground biomass was measured in this study, shifts in biomass allocation are suggested by the difference between the suppressive effects of *Bromus inermis* on the native grasses (Fig. III-5) and the reciprocal effects of the native grasses on *B. inermis* (Fig. III-8). This difference could be a response to varying intensity of below-ground competition. For example, *Stipa comata* performed relatively poorly with *Bromus inermis* in the dry treatment (Fig. III-5), but its influence on *B. inermis* was similar to those of the other grasses (Fig. III-8). This indicates that *B. inermis* had a significant impact on the above-ground growth of *Stipa comata* during the establishment stage while at the same time *S. comata* was competing strongly below-ground with *Bromus inermis* for the limiting moisture resource. If this scenario is true, *S. comata* could maintain itself and compete with *B. inermis* in a dry regime; moreover, if some other factor reduced the productivity of *B. inermis* (e.g. severe drought or differential grazing), then *Stipa comata* could even predominate. The same relationship is evident with *S. curtiseta* in the moist treatment. *Agropyron trachycaulum* performed comparatively well when moisture stress suppressed *Bromus inermis*, but was a poor competitor when soil moisture was not limiting (Fig. III-5). The interspecific above-ground growth performance of *B. inermis* would indicate that *Agropyron trachycaulum* is an average to strong competitor similar to *A. dasystachyum* (Fig. III-8). This suggests a greater proportional investment by *A. trachycaulum* in the root system rather than the shoot system. In contrast, *A. dasystachyum* and *Stipa viridula* seem to be average and strong competitors, respectively, without any suggestions of trade-offs in biomass allocation. This was shown by their consistent ranking across the moisture gradient when competing with *Bromus inermis* (Fig. III-5 and Fig. III-8).

One must be cautious about drawing firm conclusions from the ratios based on comparative above-ground performance between mixed-cultures and monocultures because intraspecific and interspecific competitive ability may be quite different (Eagles, 1983). It should also be noted that there is no strong evidence that individuals actually do allocate more biomass to roots in competitive situations (Ennik and Baan Hofman, 1983).

3.6. CONCLUSIONS

The following ratings of competitive ability describe the relative hierarchical standing among the five native grasses. The ratings are determined from (1) the above-ground biomass attained in competition with *Bromus inermis* and from (2) the relative above-ground biomass attained by *B. inermis* in competition with the native species. The overall competitive ability is relative to the other native grasses. Their performance is rated from the relatively best competitor (1) to the poorest (5).

Agropyron dasystachyum

	Dry	Moist	Wet
Rating from own growth -	3	3	2
Rating from growth of - *Bromus inermis*	4	3	4

Overall Competitive Ability - relatively good

Agropyron trachycaulum

	Dry	Moist	Wet
Rating from own growth -	2	2	4
Rating from growth of - *Bromus inermis*	3	1 (tie)	5

Overall Competitive Ability - moderately good in less stressful situations

- a stress tolerator

Stipa comata

	Dry	Moist	Wet
Rating from own growth -	4	4	3
Rating from growth of - *Bromus inermis*	2	5	2

Overall Competitive Ability - poor in non-stressful (productive) environments

- a stress tolerator

Stipa curtiseta

	Dry	Moist	Wet
Rating from own growth -	5	5	5
Rating from growth of - *Bromus inermis*	5	4	3

Overall Competitive Ability - poor

- a stress tolerator

Stipa viridula

	Dry	Moist	Wet
Rating from own growth -	1	1	1
Rating from growth of - *Bromus inermis*	1	1 (tie)	1

Overall Competitive Ability - strongest native competitor

Competition from *Bromus inermis* had a significant negative effect on the above-ground growth performance of the five native grass species. Water stress also reduced growth significantly in all six grasses. Relative competitive ability differentiated the grasses into those which are stress-tolerant, often slower-growing, and less competitive; and those which are more productive, have a higher potential growth rate, and a greater competitive ability. It was apparent that below-ground interactions were an important component at all levels along the moisture gradient.

Soil moisture deficits inhibited the expression of attributes, such as rapid growth rate, which confer competitive advantages to the productive species, thus (1) suppressing above- and below-ground growth in these species, (2) preventing above-ground resource pre-emption, and (3) greatly limiting competition to below-ground. As resources became more available, the competitive attributes of the productive species were expressed and differences in individual above-ground growth led to asymmetric competition and dominance. It appears that competitive outcomes between species, succession, and vegetation community development all depend on (1) species attributes which enhance competitive ability, and (2) the influence of abiotic gradients on the expression or suppression of these attributes, as hypothesized by Wilson and Keddy (1986a).

Competitive similarity decreased with increasing resource availability (Table III-3) and interspecific competition became more important than moisture stress (Table III-4). The ability of the more stress-tolerant native species to effect greater relative growth reduction on a productive strong competitor (*Bromus inermis*) under low moisture resource levels (Fig. III-8) suggests that strong competitors can survive in low resource sites, but may be outcompeted by stress tolerators as stated by Tilman (1982). The apparent shift in proportional biomass allocation above- and below-ground indicated that trade-offs may have been made in competitive ability relative to the resource level (Section 3.5.6) as hypothesized by Tilman (1990a). These indicators plus the excellent survivorship and performance of all species in monoculture under severe moisture stress (Fig. III-2) attest that tolerance of stressful environmental conditions is probably less important than competitive exclusion in determining species distribution patterns along abiotic gradients. These conclusions tend to support Tilman's theories on succession and vegetation community dynamics (Tilman, 1982; Tilman, 1988; Tilman, 1990a; Tilman, 1990b) and not Grime's theories (Grime, 1979).

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IV. CONCLUSIONS

This research was undertaken to answer some key questions of importance to the implementation of prairie landscape restoration. An undulating terrain produces a wide variety of environments. This variability includes changes in soil type, texture, chemistry, and profile, moisture-holding capacity and availability, slope, aspect, and differences in soil flora and fauna. "How does a changing soil environment affect the appropriate selection of species and seed mixtures used for restoration within an undulating landscape?" This question was addressed by seeding six dominant native prairie grasses at five sites along a hillside (topographic gradient) to examine differences in germination rate, survivorship, and productivity. An irrigation treatment provided evidence for the outcome of artificially increasing moisture availability or for a restoration effort within a higher precipitation regime. A more difficult question to answer is, "How do species interact with each other in different soil environments?". This question was addressed by examining how water, one of the most important resources that varies with topography, at different levels of availability affects the competitive ability of five dominant native prairie grasses. The last question - "How well do the native grass species compete with *Bromus inermis*, a destructive exotic invader of native prairie, in three different moisture regimes?" - was addressed by using *B. inermis* as a competitive phytometer.

4.1. Germination and Establishment

The rates of germination (*sensu* emergence), survivorship, and in most cases productivity were controlled by moisture availability, which was mediated largely by topographic position and soil type (Figs. IV-1, IV-2, and IV-3). A high salinity level had a greater influence than other environmental factors, usually decreasing the measured properties, as was observed in the lowland site. Germination and establishment were most successful in the first year, especially when germination was quick and the majority of germinants developed synchronously. By so doing, these initial germinants avoid strong competition from large neighbours and have the best chances for survival. Substantial germination in species with hard seed-coats was delayed until the second year.

Higher survivorship occurred for older, more established plants which presumably developed a more extensive root system before the onset of an extended dry period. This was corroborated during the second year which, unlike the first year, had a prolonged dry period following germination that killed many seedlings. Mortality of established plants in their second year, although not extremely frequent, was most often observed in the same species and locations as those that succumbed to moisture stress in the first year.

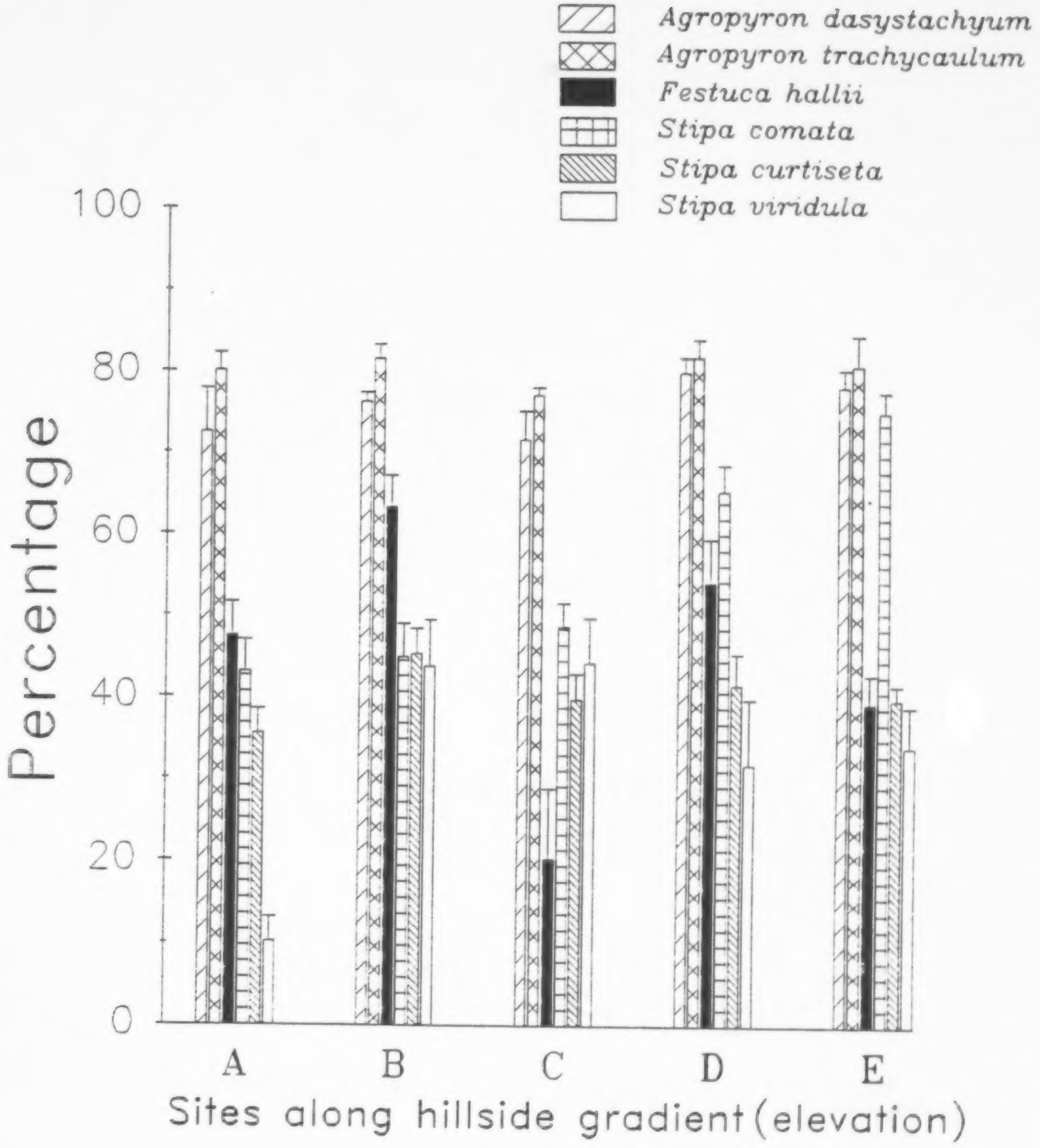

Fig. IV-1. Mean (n=6) and S.E.M. of total germination during the two year period (1989 and 1990) under natural precipitation (control moisture treatment) at five locations along a hillside (A=ridgetop and E=lowland). For more details or comparison with first year irrigation results, see Fig. II-15. Means and standard errors in Appendix 5-Table 10.

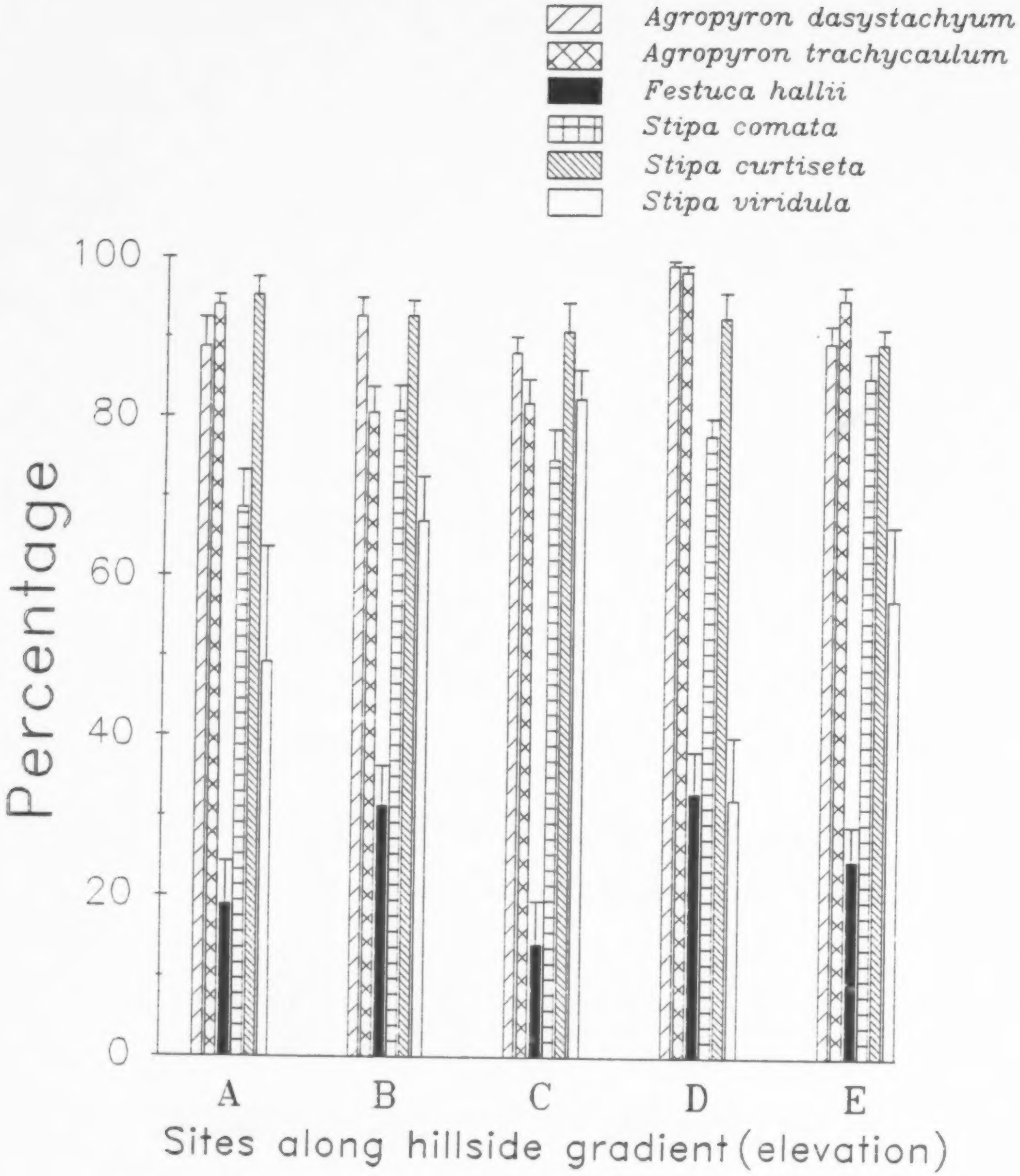

Fig. IV-2. Mean (n=6) and S.E.M. of total survivorship (percentage of total number of germinants) at the end of the second field season (30 July 1990) under natural precipitation (control moisture treatment) at five locations along a hillside (A=ridgetop and E=lowland). For more details or comparison with first year irrigation results, see Fig. II-20. Means and standard errors in Appendix 5-Table 15.

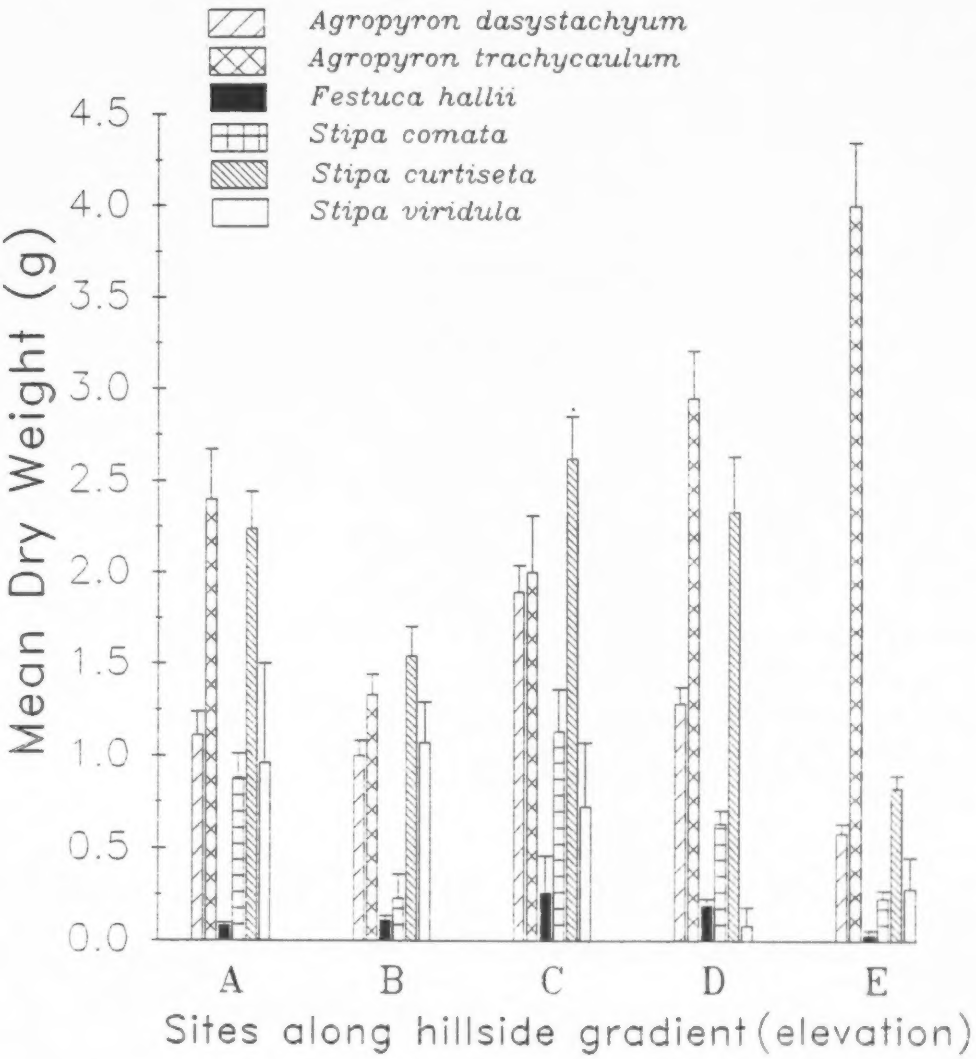

Fig. IV-3. Least-squares mean and S.E.M. of individual above-ground biomass at the end of the second growing season (1990) under natural precipitation (control moisture treatment) at five locations along a hillside (A = ridgetop and E = lowland). For more details or comparison with first year irrigation results, see Fig. II-23. Means and standard errors in Appendix 5-Table 18.

Tiller production in the first year was not correlated with flowering culm production in the second year. Both of these reproductive properties showed a positive correlation with above-ground biomass production in their respective years.

4.2. Irrigation

Irrigation increased total germination by increasing the soil water potential and by maintaining a soft surface-soil consistency. The germination of *Stipa* seeds in treatment plots irrigated the first year was reduced during the second year. This may have been a result of lost viability from constant irrigation in the first year while the seeds were dormant. The fate of the seeds that did not germinate is not known. For species without a large proportion of dormant seeds, however, irrigation slightly increased survivorship, and the marginal benefit persisted through the second year.

Irrigation did not have an universally positive effect on production of tillers and shoot biomass, but it did produce some significant increases, particularly in the soft-seeded species (*Agropyron dasystachyum, A. trachycaulum, Festuca hallii*). Growth and productivity in the second year were reduced slightly in some cases by the irrigation throughout the growing season in the previous year, particularly for *Agropyron dasystachyum* and *A. trachycaulum*. Shallower root development may have resulted from irrigation, putting these individuals under greater moisture stress without irrigation in the second year.

The topographic locations with the greatest moisture stress benefited the most from the additional water. Overall, irrigation had little lasting positive influence and could be more detrimental than beneficial for some species and sites. Hastened germination and earlier establishment were some positive results obtained from irrigation.

4.3. Competition

The competitive ability of the native grasses varied greatly among species and also varied with moisture availability (Fig. IV-4). The native grasses performed better under abiotic stress imposed by drought than under moister conditions which induced both stronger below-ground competition and above-ground shading from the taller less restricted growth of *Bromus inermis*. Biomass production for all species was limited by water availability. At all moisture levels, *B. inermis* had a significant negative impact upon growth of all native species, although the competitive influence of the native species on *B. inermis* increased with decreasing moisture availability. This exotic grass was the least affected by water stress, was the superior competitor at all moisture levels, and had a greater competitive affect upon itself than any of the native

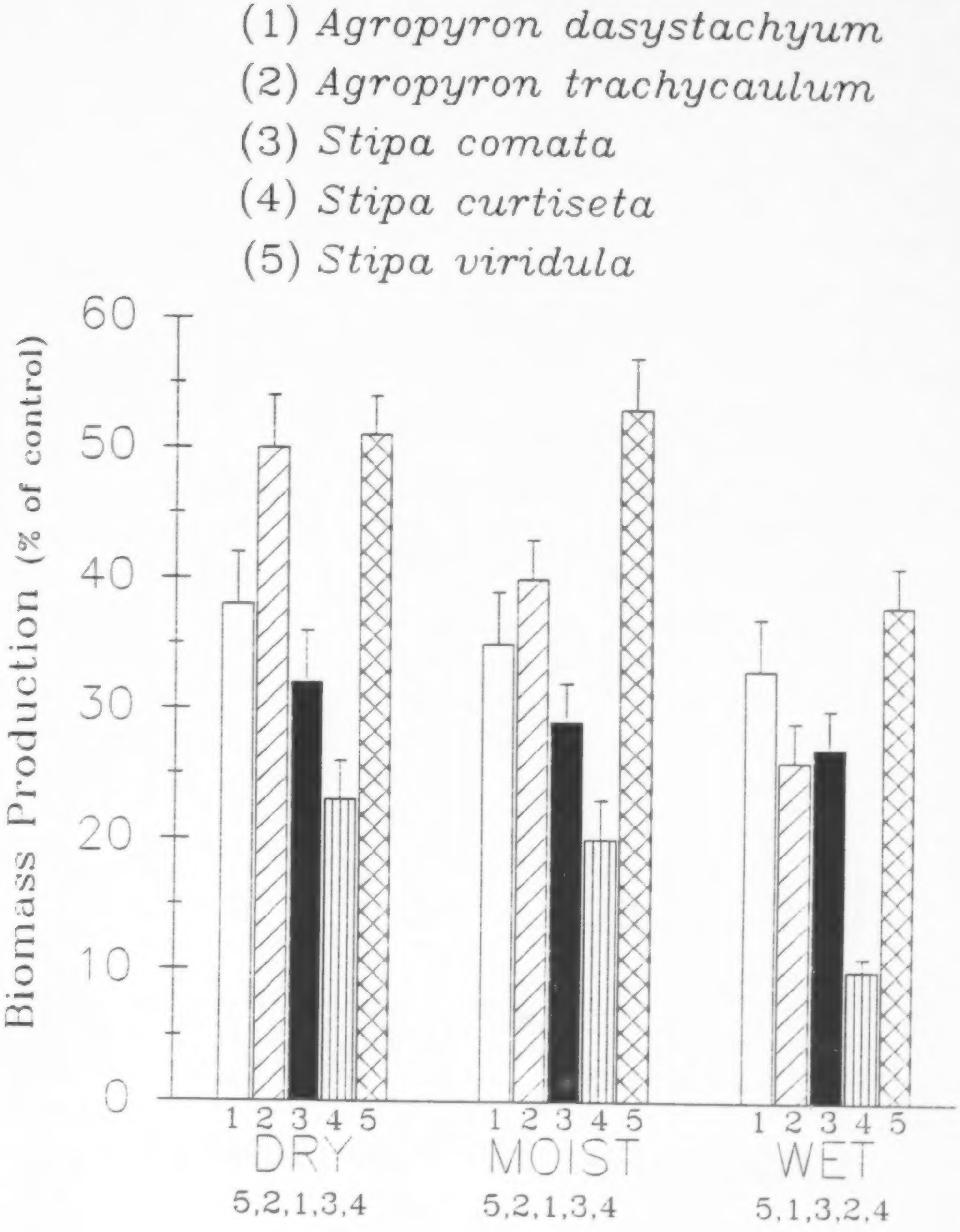

Fig. IV-4. Biomass production of native grasses competing with *Bromus inermis* at three moisture levels for 119-122 days. Growth represented as a percentage of their biomass production in monoculture controls. Hierarchies of species competitive ability with *B. inermis* are shown for each moisture treatment. Means and standard errors in Appendix 8-Table 3.

grasses had on it.

The rank order of species shoot biomass production in the dry regime relative to the wet monocultures (i.e., abiotic stress) was identical to the rank order for competitive performance with *Bromus inermis* in the wet regime (i.e., biotic stress). This suggested that the native grasses respond similarly to abiotic and biotic stress, and that the interaction between the grasses was mainly below-ground competition for water.

The mechanism and intensity of competition both appeared to change with availability of water. When soil moisture was not limiting, competition above ground became more apparent and species attributes such as growth rate and plant height provided a greater advantage for obtaining other resources, including light. Soil moisture deficits inhibited the expression of competitive attributes, such as rapid tall growth, in some species.

Relative competitive ability differentiated the grasses into those which are stress-tolerant, often slower-growing, and less competitive (*Stipa comata, S. curtiseta*, and *Agropyron trachycaulum*); and those which are more productive, have a higher potential growth rate, and a greater competitive ability (*Agropyron dasystachyum, Stipa viridula*, and *Bromus inermis*). The hierarchy of competitive influence of the native species on *Bromus inermis*, as measured by above-ground biomass production, was not always identical to the influence of *B. inermis* on the growth of the native grasses. This implies that above-ground growth is not completely indicative of a species competitive ability. Moreover, root and shoot resource partitioning may provide important differences in a species competitive strategy. Grime's (1979) theory of competitiveness and plant strategies would suggest that a trade-off is made between stress-tolerance and competitive ability. The study species that exhibited greater stress tolerance (*Stipa comata, S. curtiseta*, and *Agropyron trachycaulum*) showed evidence of shifting biomass allocation to below-ground in response to intense competition. Root competition appeared to be very important at all levels along the moisture gradient. Although there were few competitive reversals under experimental conditions, there were trends implying that differential species responses would produce greater species competitive reversals along more stressful complex-gradients such as natural topographic gradients.

I conclude that species competitive ability, species distribution patterns, and ultimately community development along abiotic gradients are determined more by the suppression or expression of competitive traits along these gradients and by competitive exclusion than by the tolerance of stressful abiotic environmental conditions. Therefore, competition under environmental constraints rather than solely environmental limitation is responsible for vegetation composition.

4.4. RELEVANCE AND IMPLICATIONS FOR RESTORATION

4.4.1. Germination and Establishment

Before any native species are planted, site preparation is crucial for reducing subsequent competition from undesirable weedy growth (Duebbert et al., 1981). The best opportunity for germination and establishment occurs in the first year because after the initial cohort of germinants develop, moisture stress is increased by competition with existing plants and significantly reduces successful establishment of later germinants. A successful planting can be achieved by (1) appropriate planting methods, e.g., seeding when the soil surface is friable to allow proper placement of seed under the soil surface followed by surface packing to provide good seed-soil contact, (2) scarifying hard-coated seeds to promote rapid germination (omit this process if seeding in fall or winter), and (3) timing planting to expose seeds to the period of greatest available soil moisture when temperatures are between 10° and 20 °C to induce germination. Exposing seeds to a cooler moist period will greatly promote germination in those species, particularly many of the forbs (Morgan and Collicutt, 1992), which require cool-moist stratification prior to germination (Rock, 1981). This would occur naturally in the early spring.

Establishment and productivity results will differ from year to year with variations in precipitation and temperature. Survivorship will be greatly reduced if a prolonged dry period follows immediately after germination before plants can develop a sufficient root system. Thus, the species composition that develops in a restoration planting could be greatly influenced by weather anomalies in the first growing season.

4.4.2. Irrigation

Irrigation does benefit germination and establishment in the first year, but if the soil is kept continually moist, dormant seeds may degrade and lose viability. The benefits from first-year irrigation on survivorship usually persisted through the second growing season, although growth and productivity in the second year may be reduced if plants were constantly irrigated in the first year. This appeared to occur in *Agropyron dasystachyum* and *A. trachycaulum.*

The benefit of early seedling development from irrigation could significantly increase survivorship in regions where the spring rainy season is short and is followed by a hot dry growing season. Therefore, if natural precipitation or moisture levels are lacking in the first few weeks after emergence, irrigation could significantly increase the survivorship of seedlings and the establishment of plants. After early establishment has been achieved, there may be little long-term benefits by continuing irrigation.

The additional water could reveal the potential distribution of establishment during a wetter summer or in an area with a wetter moisture regime. Because of adequate precipitation at this location during the germination period in 1989, irrigation was found not to improve vastly or to expand the germination and establishment potential of any of the native species with the exception of *Festuca hallii*. Higher germination, establishment, and productivity under a more moist regime could produce a wider range of distribution and greater abundance of drought-sensitive species, at the expense of other species, in areas which otherwise would be at or beyond their tolerance limits.

The production of larger plants in the first year through increased moisture availability (e.g., greater number of tillers) did not assure greater seed production in the second year of the study. Thus, addition of water either naturally or artificially in the establishment year may have little influence on future seed production and recruitment. This may not be the case in subsequent years if increased moisture levels improve growth in the year of seed production.

4.4.3. Considerations for Planning a Prairie Restoration

The soil environment of an undulating landscape is a mosaic of texture, chemistry, soil profiles, and water holding capacity, and expresses continual changes in water availability with respect to these properties and position along the topographic gradient. The gradient of soil properties and the factors they influence generally run parallel to the topographic gradient. Planning for a native planting within an undulating landscape should take into account topographic gradients by designing seeding patterns which reflect the changing soil properties and their effects on species establishment patterns and on interspecific interactions. For example, moisture generally increases downslope, but variations in soil texture can create deviations in this trend and alter the vegetation community which develops in this area. This ecological approach to establishing seeded grasslands was the rationale behind the "sculptured" seeding method, linking appropriate seed mixtures with soil environments, developed by the USDA-Soil Conservation Service and adopted by Ducks Unlimited Canada (Jacobson, et al., in press).

The restoration site and number and types of species to be planted will determine the outcome of any restoration project. The environmental attributes of the restoration site, including soil properties, are initial criteria for species selection or rejection. If only one or a few species are used, their possible distribution will be broader and approach their physiological range due to the lack of competitors. In a high species-diversity planting, the realized range for each species will more closely approach its narrower ecological range due to competitive exclusion. These general predictions are influenced by the species selected, their environmental tolerance limits, and their competitive ability. If species are planted in locations which approach their physiological tolerance limits, any individuals which survive the seedling stage and become established have a greater chance of succumbing to environmental stresses in the future.

No revegetation project should ever rely on one species. A single species is rarely suitable for the entire range of possible environmental conditions. In a two-species planting, the species selected should have complementary attributes which favour opposites ends of the environmental gradient. A third species should be selected for the central part of the gradient. No fewer than three species should be used for a planting. More species not only increasingly fill the available niches and reduce weedy and exotic invasion but are more appealing, both aesthetically and ecologically. A diverse multi-species planting would be much more capable of withstanding environmental perturbations (e.g., grazing, fire, and climatic fluctuations) than a low species-diversity planting. In any planting, knowledge of the soil properties and environmental conditions is crucial because the gradients of some environmental factors may run in conflicting directions and create unique situations which require more specialized species selection.

Rapid germination and establishment are desirable for a successful planting. For these reasons, the species selection and seed mixture composition should take into account the proportion of hard-seeded species in the seed mixture. A planting with a high percentage of these species would cause a possibly undesirable delay in germination of a large proportion of seeds. Many *Stipa* species, particularly *S. comata* and *S. viridula*, have seeds with indurate coats which will not all germinate in the first year. The delay in germination apparently is even more evident in legume species, which should be a component of any restoration or reclamation planting. Therefore, if species with hard seedcoats compose a significant proportion of the seed mixture, it would be advisable to add other poorly-competitive species which quickly establish, such as *Agropyron trachycaulum, Achillea millefolium, Ratibida columnifera*, and *Gaillardia aristata*, to the seed mixture. The rapid development of these species should occupy some of the initial void that would otherwise become filled by weeds. Alternatively, these hard-coated seeds could be scarified just prior to planting to promote almost complete germination in the first year. It is extremely important to scarify seeds, especially legumes, just before they are planted because once scarified these seeds can obtain moisture solely from humidity in the air and commence germination within a day or two.

The choice between local native species and related native cultivars may not be straightforward. This decision may be mired in comparisons of seed availability, species diversity, cost, appropriateness for site and goals, compatibility with surrounding vegetation, time to establishment, productivity, and long-term sustainability. This research does not address these questions and can provide only a minor comparison between the native *Stipa viridula* and the cultivar *S. viridula* (Lodorm). Differences were not great between these grasses, although the cultivar did germinate in the first year, as it was bred to do, unlike its native counterpart. Due to the predominate segregation of establishment between the two years for each species, comparison of establishment capability and productivity between these grasses is difficult. It was observed that the appearance of the cultivar was different from the local native stock and that the cultivar yellowed, developed brown blotches, and looked sickly in the second year. There are cultivars available for *Agropyron dasystachyum* and *A. trachycaulum*. Comparisons between these grasses grown at other sites and the results obtained in this experiment with the local native stock would be invalid. One must be cautious when comparing species or seed stocks that are derived from genetic material separated by a substantial distance in latitude. A southern genetic strain will grow much faster and larger than its northern counterpart as it responds to a longer daily photoperiod. If the distance is considerable, a southern strain may not produce viable seed and harden-off before winter in a northern location. What can be guaranteed is that, when making a choice between local native species and native cultivars, points gained in one category are invariably lost in another. Increased research on, interest in, and availability of local native species may make these choices easier.

The presence and/or invasion of exotic perennial species can produce unwanted results. The experiments showed that *Bromus inermis* had little difficulty establishing at any location along a topographic gradient and was a formidable competitor with all the native species. *B. inermis*' strongest competitor was itself, thus any attempts to remove this species must be complete or remaining plants will become more productive from the reduction in competition. An incomplete kill of this species, if left unchecked, would result in a rapid recolonization of its former territory. If *Bromus inermis* is abundant in the vicinity of a planting, or is expected to invade and dominate rapidly, and control or elimination of this species is not possible, an expensive high diversity planting is not recommended. In these situations, which would be more frequent in sites with moist, non-alkaline, rich soil, strongly competitive species suitable for the site and inexpensive to obtain are suggested.

The elimination of vast areas of native prairie by an exotic grass has been observed and is occurring in the Palouse Prairie in north-western USA. Although *Bromus tectorum* (downy brome) is an annual with a very different life history, the implications that *B. inermis*, a perennial, will be as destructive to native prairie habitat are very real. From the results obtained in the field and laboratory experiments (see Results sections of Chapter 2 and 3) and from my personal observations in the mixed-grass prairie (Chapter 3, section 3.5.3), I predict that, in regions where *B. inermis* is present through agricultural activities (e.g., hay fields), industrial activities (e.g., roadside ditches), and/or naturalization and given time, smooth brome would virtually wipe out all prairie grasslands except areas of large contiguous native prairie, areas intensively managed, and areas of high salinity or at the extremes of moisture availability. These observations and ominous views on the future of our native grasslands in the presence of *B. inermis* are shared by others (Romo et al., 1990).

By performing this research on a single hillside and not replicating it at different locations and in different years, there are limitations on the significance of the results for other areas and topographic gradients. These limitations should be kept in mind when considering the results and recommendations, or for incorporating these into implementation plans for restoration or revegetation at another location.

4.4.4. Restoration Attributes of Research Species

Listed are characteristics observed for each grass species which are important to consider when selecting species for a restoration project and determining appropriate mixtures for specific sites. The descriptions answer some of the questions that initiated this research.

A description of the species characteristics and properties follows:

A. Germination

Range - the lowest to highest average percent germination recorded along the gradient in the field.

Timing - the year(s) in which germination occurred after planting.

Sensitivity - the relative sensitivity of germination to differences in moisture availability along the gradient.

Effect of Irrigation - may be neutral, positive, and/or negative.

B. Survivorship (similar to germination)

Range - the average percent of germinated seeds that survived to the end of the second growing season.

C. Productivity

The properties describe factors associated with above-ground production of biomass and seed.

Establishment - the relative rate of growth and development.

Growth and Seed Production - the similarities and differences of each variable along the gradient and the factors affecting them.

Time to Seed Production - the usual time required before the majority of plants begin seed production.

Sensitivity - similar to germination.

Effect of Irrigation - similar to germination.

Salt Tolerance - a species ability to tolerate alkali soil conditions.

D. Competitive Ability

The relative hierarchical standing among the five native grasses tested (excludes *Festuca hallii*).

Ratings - range from 1, the best native competitor, to 5, the poorest.

Determined from:
(1) The above-ground biomass attained in competition with *Bromus inermis*
(2) The relative above-ground biomass attained by *B. inermis* in competition with the native grass being described.

Overall Competitive Ability - relative to the other native grasses.

E. Utilization

Important features listed for the use of each species.

Importance in Prairie - the region, site, and/or type of community where the species holds a position of dominance or importance.

Sites for Use - the locations where the species should or should not be planted.

Seeding Rate - sites for planting and recommended percent composition of seed mixtures.

Recruitment - the method(s) of propagation.

Desirable Features - attributes that are beneficial for restoration projects or native plantings.

Limitations - limitations of each species in various sites and aspects of restoration plantings.

1. *Agropyron dasystachyum* (Hook.) Scribn. (northern wheatgrass)

A. Germination

Range - 72% to 83% (High)

Timing - first growing season

Sensitivity - slightly sensitive

Effect of Irrigation - slightly positive in dry sites

B. Survivorship

Range - 88% to 99% (High)

Sensitivity - slightly sensitive

Effect of Irrigation - slightly positive

C. Productivity

Establishment - moderately rapid

Growth and Seed Production - similar along gradient except lower in saline sites

-increased in coarse or fine-textured soils

Time to Seed Production - 2 years

Sensitivity - slightly sensitive

Effect of Irrigation - very slightly positive

Salt Tolerance - low to moderate

D. Competitive Ability

	Dry	Moist	Wet
Rating from own growth -	3	3	2
Rating from growth of - *Bromus inermis*	4	3	4

Overall Ability - relatively good

E. Utilization

Importance in Prairie - most common grass of mixed-grass prairie

Sites for Use - all except periodically flooded and excessively saline

Seeding Rate - low (<10%) in a diverse planting

- lower in drier sites

Recruitment - by seed and vegetative propagation

Desirable Features - rhizomatous

- good species to use solely or in a low diversity mixture for creating buffer zones to slow or halt the invasion of problem exotic species

- ideal for low-maintenance landscaping and pastures

- suspected of being allelopathic to other species (pers. comm., Doug Lammer)

Limitations - species diversity in a planting will suffer through competitive elimination if this grass forms more than 50% of the seed mixture

2. *Agropyron trachycaulum* (Link) Malte (slender wheatgrass)

A. Germination

Range - 77% to 86% (High)

Timing - first growing season

Sensitivity - slightly sensitive

Effect of Irrigation - very slightly positive

B. Survivorship

Range - 80% to 98% (High)

Sensitivity - moderately sensitive

Effect of Irrigation - positive in dry sites

C. Productivity

Establishment - rapid

Growth and Seed Production - performance better on lower slope fairly good on ridgetop
-enhanced by increased moisture

Time to Seed Production - 1 to 2 years

Sensitivity - very sensitive

Effect of Irrigation - positive at some sites
-detrimental in year after irrigation

Salt Tolerance - high

D. Competitive Ability

	Dry	Moist	Wet
Rating from own growth -	2	2	4
Rating from growth of - *Bromus inermis*	3	1 (tie)	5

Overall Ability - moderately good in less stressful situations
- a stress tolerator

E. Utilization

Importance in Prairie - dominant in periodically wet prairie areas

Sites for Use - all except excessively dry ones

Seeding Rate - high (>50%) in moist areas
- low for dry sites in a high-diversity planting

Recruitment - by seed

Desirable Features - ideal as a nurse crop

- seed production plots highly productive

- ideal for use as a site-preparation crop because of strong facultative mycorrhizal properties (Dr. J.P. Tewari, pers. comm.) and abundant, inexpensive seed

- salt tolerant

Limitations - dry sites; poor competitor in productive sites

3. *Festuca hallii* (Vasey) Piper (plains rough fescue)

A. Germination

Range - 20% to 76% (Low to High)

Timing - first growing season

Sensitivity - very sensitive

Effect of Irrigation -very positive

B. Survivorship

Range - 14% to 65% (Low to Moderate)

Sensitivity - very sensitive

Effect of Irrigation - very positive

C. Productivity

Establishment - very slow

Growth - highly correlated with soil moisture-holding capacity

Time to Seed Production - unknown

Sensitivity - very sensitive

Effect of Irrigation - very positive

Salt Tolerance - moderate

D. Competitive Ability

Overall Ability - undoubtedly poor during early establishment

E. Utilization

Importance in Prairie - dominant in areas of fescue grassland and aspen parkland

Sites for Use - black soil sites

Seeding Rate - high (50%) - if rapid development of fescue prairie desired

- low in all other cases

Recruitment - by seed and slow vegetative propagation

Desirable Features - slightly rhizomatous

Limitations - slow establishment

- infrequent seed production (every 5-10 years)

- seedlings drought sensitive

4. *Stipa comata* Trin. & Rupr. (needle and thread grass)

A. Germination

Range - 30% to 75% (Moderate to High)

Timing - most in second growing season; many seeds may still be dormant after second growing season

Sensitivity - little sensitivity

Effect of Irrigation - none in first year

- negative for germination in second year

B. Survivorship

Range - 60% to 85% (High)

Sensitivity - slightly sensitive in first 2-3 weeks

- constant along topographic gradient

Effect of Irrigation - none to very slightly positive

C. Productivity

Establishment - moderate rate

Growth and Seed Production - better on upper half of gradient

Time to Seed Production - 2 years

Sensitivity - none to very slightly sensitive

Effect of Irrigation - slightly positive at some sites

Salt Tolerance - low to moderate

D. Competitive Ability

	Dry	Moist	Wet
Rating from own growth -	4	4	3
Rating from growth of - *Bromus inermis*	2	5	2

Overall Ability - poor in non-stressful (productive) environments
- a stress tolerator

E. Utilization

Importance in Prairie - a dominant of dry mixed-grass prairie

Sites for Use - all except those excessively wet or wet-saline

- excellent for dry, coarse-textured soils

Seeding Rate - reduce in moist sites if species that are more productive and competitive on such sites have been included

Recruitment - by seed only

Desirable Features - abundant annual production of seed is efficiently self-seeded allowing relatively rapid invasion into proximal vacant space
- can germinate, survive, and grow in dry environments

Limitations - seed scarification necessary to increase first year germination and successful establishment

5. *Stipa curtiseta* (A.S. Hitchc.) Barkworth (porcupine grass)

A. Germination

Range - 36% to 52% (Moderate)

Timing - majority in first growing season; few may still be dormant after second growing season

Sensitivity - none to very slightly sensitive

Effect of Irrigation - very slightly positive in dry sites

B. Survivorship

Range - 89% to 96% (High)

Sensitivity - none, except very early seedling stage

Effect of Irrigation - very slightly positive to slightly negative for germinants in year after irrigation

C. Productivity

Establishment - moderate

Growth and Seed Production - constant along gradient except for dramatic reduction in saline lowland

Time to Seed Production - 2 years

Sensitivity - fairly sensitive

Effect of Irrigation - none to fairly positive

Salt Tolerance - low

D. Competitive Ability

	Dry	Moist	Wet
Rating from own growth -	5	5	5
Rating from growth of - *Bromus inermis*	5	4	3

Overall Ability - poor

- a stress tolerator

E. Utilization

Importance in Prairie - a dominant of moist mixed-grass prairie and a sub-dominant of the aspen-parkland and fescue prairie

Sites for Use - all except those excessively wet or saline

Seeding Rate - moderate to high in moist sites

- reduce if many other more competitive and productive species are included

Recruitment - by seed only

Desirable Features - abundant annual production of seed is efficiently self-seeded allowing relatively rapid invasion into proximal vacant space

Limitations - poor competitive ability in productive environments

6. *Stipa viridula* Trin. (green needle grass)

A. Germination

Range - 8% to 44% (Low to Moderate)

Timing - few in first year, half in second year, and presumably rest of seeds are still dormant after second growing season

Sensitivity - slightly to fairly sensitive

Effect of Irrigation - negative

B. Survivorship

Range - 32% to 82% (Moderate to High)

Sensitivity - variable (higher survivorship in clay-textured soils)

Effect of Irrigation - slightly positive to negative

C. Productivity

Establishment - moderately rapid

Growth and Seed Production - much higher in clay-textured soil locations
- greatly reduced by intraspecific competition

Time to Seed Production - 2 years

Sensitivity - none

Effect of Irrigation - slightly positive to slightly negative

Salt Tolerance - low to moderate

D. Competitive Ability

	Dry	Moist	Wet
Rating from own growth -	1	1	1
Rating from growth of - *Bromus inermis*	1	1 (tie)	1

Overall Ability - strongest native competitor

E. Utilization

Importance in Prairie - abundant in high clay-textured soil sites

Sites for Use - all except excessively wet or saline

Seeding Rate - reduced in high-diversity plantings

- higher in locations of high clay-textured soil

- high if seeds are not scarified

Recruitment - by seed only

Desirable Features - large robust plant

- large, tufted and competitive nature makes it suitable as a component of buffer zones between native prairie reserves and exotic vegetation communities

- ideal for decorative landscaping

- 100% germination in first year with seed scarification

Limitations - without seed scarification, germination in first year is negligible

7. *Bromus inermis* Leyss. (smooth brome)

A. Germination

Range - 87% to 95% (High)

Timing - first growing season

Sensitivity - very slightly sensitive

Effect of Irrigation - very slightly positive

B. Survivorship

Range - 86% to 99% (High)

Sensitivity - somewhat sensitive

Effect of Irrigation - positive

C. Productivity

Establishment - rapid

Growth - greatly enhanced at sites with richer soil and higher moisture availability

Time to Seed Production - speculate 2 years

Sensitivity - very sensitive

Effect of Irrigation - positive on dry sites

Salt Tolerance - moderate

D. Competitive Ability

Overall Ability - stronger than all native research species

E. Features

Importance in Prairie - destructive invader of moist native prairie

Recruitment - invasion into new areas by seed and expansion largely by vegetative propagation

Problematic Features - rhizomatous

- rapid, tall growth
- strong competitor that eliminates almost all other species
- abundant seed production

Limitations - extremely dry, wet, or saline sites

- suppressed by fire in the growing season
- suppressed by appropriate grazing intensity

4.4.5. Recommended Percentage[3] for Seeding Mixtures of Research Species[1] for Various Upland Environmental Conditions[2]

	Dry	Moist	Wet	Coarse	Clay	Black
AGDA	5	10	20	5	10	5
AGTR	15	25	50	15	15	15
FEHA	0	5	5	0	0	50
STCO	50	15	0	50	20	0
STCU	25	35	15	25	15	20
STVI	5	10	10	5	40	10

1 - Species are AGDA - *Agropyron dasystachyum*; AGTR - *A. trachycaulum*; FEHA - *Festuca hallii*; STCO - *Stipa comata*; STCU - *S. curtiseta*; STVI - *S. viridula*.

2 - The environmental conditions are: Dry = dry sites; Moist = moist sites; Wet = wet sites; Coarse = coarse-textured soils; Clay = clay-textured soils; Black = rich organic black soils.

3 - Some background reasons on how percentages for recommended seeding mixtures are obtained. Each species' attributes and capabilities must be considered along with their moisture requirements, their suitability for the soil type(s) to be planted, and their interaction, competitively and otherwise, with other candidate species in the mixture. Sometimes a species' composition in a mixture is elevated because most other available species are less suitable for the site (e.g., 50% *Agropyron trachycaulum* for a wet soil, 50% *Stipa comata* for a dry soil, and 100% *A. trachycaulum* for a wet-saline soil - see section 2.7).

Agropyron dasystachyum - suspected of being allelopathic towards other species (pers. comm., Doug Lammer); high germination rate; spreads rapidly by rhizomes.

For these reasons, the proportional composition of this species in a seed mixture should be low as it will gain prominence quickly. Moist sites tend to have more competitive species and growth, thus the initial composition of this species can be higher at these sites.

Agropyron trachycaulum - this species performs better in wet and saline upland conditions; has a high germination rate; establishes quickly; is not overly competitive; spreads by abundant seed production.

For these reasons it is seeded heavily in wet and saline sites. Quick establishment makes this species ideal for inclusion at lower rates in all other sites as a nurse crop.

Festuca hallii - slow establishment; seedlings drought sensitive; spreads slowly by rhizomes.

This species is suitable for moist, rich soils. It can be included as a small component in these sites or planted heavily if development of a fescue prairie community is desired.

Stipa comata - performs well at all sites except those excessively wet or saline; poor competitor; abundant production of seed that establishes easily.

This species is suitable for coarse, dry soils where there are less competitive species. Proximal vacant space can be easily filled by recruitment.

Stipa curtiseta - performs well at all sites except those excessively wet or saline; poor competitor; abundant production of seed that establishes easily; it does not perform as well on extremely dry sites as *S. comata*.

This species is suitable for most well-drained dry to moist soils where there are few strongly competitive species. Proximal vacant space can be easily filled by recruitment.

Stipa viridula - this species distribution is highly correlated with clay soils; strong competitor; 100% germination if seeds scarified; without scarification, extremely low germination in first year and half potential germination in 2nd year, therefore half of live seeds do not germinate until at least 3rd growing season.

This species should be planted heavily in clay-soiled sites. If seeds are not scarified, the number of seeds planted should be increased to compensate for the reduced survivorship of germinants within the established vegetation in the years following planting.

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UNIVERSITY OF ALBERTA

GERMINATION, SURVIVORSHIP, PRODUCTIVITY, AND COMPETITIVE ABILITY OF SIX NATIVE GRASS SPECIES FROM THE NORTHERN MIXED-GRASS PRAIRIE FOR USE IN PRAIRIE VEGETATION RESTORATION

"APPENDICES"

BY
DEAN NERNBERG

A Thesis submitted to the Faculty of Graduate Studies and Research in Partial Fulfilment of the Requirements for the Degree of

MASTER OF SCIENCE
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TABLE OF CONTENTS

PAGE

APPENDIX 1 Soil descriptions of the five sites along the topographic gradient....170

APPENDIX 2 Locations of species subplots within treatment plots and site locations....175

APPENDIX 3 Dates and locations of seed collection for field experiment....177

APPENDIX 4 Daily precipitation and temperature at study area and Last Mountain Lake Climatological Station (HQ) during the field season in 1989....178

APPENDIX 5 Table 1. Monthly means from 14 years of precipitation and temperature data for Last Mountain Lake National Wildlife Area....181

Table 2. Monthly precipitation and mean temperatures during 1989, 1990, and 14 year average at Last Mountain Lake NWA and 39 year normals from Nokomis, SK....181

Table 3. Mean of soil moisture content from surface and deep soil strata exposed to given pressure potentials....182

Table 4. Mean of the moisture content of soil cores..183

Table 5. Proportional composition of surface soil texture....183

Table 6. Soil chemical properties of surface soil samples....184

Table 7. Mean of total germination during 1989....185

Table 8. Mean of total germination during 1990....185

Table 9. Mean of the number of new germinants at each cohort count date....186

Table 10. Mean of total germination during 1989 and 1990....190

Table 11. Mean of total survivorship at the end of the 1989 field season....191

Table 12. Mean of the number of germinants in select cohorts surviving at each subsequent count date in 1989 and 1990....192

Table 13. Mean of total 1990 survivorship 195

Table 14. Mean of total survivorship of 1989 survivors at end of 1990 field season 196

Table 15. Mean of total survivorship at end of second field season 197

Table 16. Mean of total survivors at end of second field season 198

Table 17. Least-squares mean of individual above-ground biomass at end of first growing season (1989) 199

Table 18. Least-squares mean of individual above-ground biomass at end of second growing season (1990) 200

Table 19. Least-squares mean of the number of tillers per individual at end of first growing season 201

Table 20. Least-squares mean of flowering culms per individual at end of second growing season 202

APPENDIX 6

Table 1.1. *Agropyron dasystachyum* individual data from field experiment including germination and survivorship in 1989 and 1990 203

Table 1.2. *Agropyron trachycaulum* individual data from field experiment including germination and survivorship in 1989 and 1990 221

Table 1.3. *Bromus inermis* individual data from field experiment including germination and survivorship in 1989 and 1990 238

Table 1.4. *Festuca hallii* individual data from field experiment including germination and survivorship in 1989 and 1990 250

Table 1.5. *Stipa comata* individual data from field experiment including germination and survivorship in 1989 and 1990 267

Table 1.6. *Stipa curtiseta* individual data from field experiment including germination and survivorship in 1989 and 1990 286

Table 1.7. *Stipa viridula* individual data from field experiment including germination and survivorship in 1989 and 1990 305

Table 1.8. *Stipa viridula* (Lodorm) individual data from field experiment including germination and survivorship in 1989 and 1990....................324

Table 2. Individual data from field experiment including biomass, tiller, and flowering culm data from 1989..341

Table 3. Individual data from field experiment including biomass and flowering culm data from 1990...371

Table 4. Soil texture data from individual samples...399

Table 5. Soil chemistry data from individual samples.400

Table 6. Soil moisture content from individual soil cores...401

Table 7. Pressure plate analysis data from individual samples.................................407

APPENDIX 7 Dates and locations of seed collection for competition experiment..............................414

APPENDIX 8 Table 1. Individual means of native grass above-ground biomass competing in monoculture or in mixture with *Bromus inermis* at three moisture levels.......................................415

Table 2. Means of biomass production of native grasses competing intraspecifically under two levels of moisture stress............................415

Table 3. Means of biomass production of native grasses competing with *Bromus inermis* at three moisture levels.......................................416

Table 4. Means of individual above-ground biomass of *Bromus inermis* competing in monoculture or in mixture with each native grass species at three moisture levels.......................................416

Table 5. Biomass production of *Bromus inermis* competing with native grass species at three moisture levels.......................................417

APPENDIX 9

Table 1. Individual data from competition experiment including intraspecific and interspecific data for native grasses and intraspecific data for *Bromus inermis*....................................418

Table 2. Individual data from competition experiment including interspecific data for *Bromus inermis*.......429

Appendix 1

Soil descriptions of the five sites along the topographic gradient.

Site A - Orthic Dark Brown Chernozem

Horizon	Depth (cm)	Description
LF	5-0	Black; semidecomposed organic matter; abundant, very fine to medium roots; abrupt, smooth boundary; 5 cm thick.
Ah	0-12	Brownish black (10YR 2/2 m, 10 YR 4/2 d); sandy loam; moderate-strong, very fine to fine, granular; soft; non-plastic; abundant, very fine roots, random; abrupt, smooth boundary; 12 cm thick.
Bm	12-26	Dark brown (10YR 3/4 m); silty clay; strong, very fine subangular blocky; slightly hard; very plastic; plentiful, very fine to fine roots; clear, smooth boundary; 14 cm thick.
BC	26-34	Dull yellowish brown (10YR 4/3 m); clay; moderate, very fine to fine granular; slightly hard; plastic; plentiful, very fine to fine roots; abrupt, smooth boundary; 12 cm thick.
Ck	34+	Dull yellowish brown (10YR 5/3 m); clay; weak to moderate, very fine to fine granular; soft; very plastic.

Site B - Orthic Dark Brown Chernozem

Horizon	Depth (cm)	Description
LF	4-0	Black; semidecomposed organic matter; abundant, very fine to medium roots; abrupt, smooth boundary; 4 cm thick.
Ah	0-23	Brownish black (10YR 2/3 m, 10YR 4/2 d); sandy loam; moderate, very fine granular; soft; slightly plastic; abundant, very fine roots; abrupt wavy boundary; 23 cm thick.
Bm	23-40	Brownish black (10YR 2/3 m); sandy loam; weak to moderate, structureless to very fine granular; soft; non plastic; abundant, very fine roots; very rocky; abrupt, smooth boundary; 17 cm thick.
Ck_I	40-48	Dull yellow orange (10 YR 7/3 m); silty clay; amorphous; sightly plastic; plentiful, fine roots; very rocky; abrupt, smooth boundary; 8 cm thick.
Ck_{II}	48+	Dull yellow orange (10 YR 7/3 m); silty clay; amorphous; slightly plastic.

Site C - Orthic Black Chernozem

Horizon	Depth (cm)	Description
LF	3-0	Black; semidecomposed organic matter; abundant, very fine to medium roots; abrupt, smooth boundary; 3 cm thick.
Ah	0-12	Black (10YR 2/1 m, 10YR 3/3 d); sandy clay loam; moderate to strong, very fine to fine granular; soft; slightly plastic; abundant very fine to fine roots; abrupt, smooth boundary; 12 cm thick.
Bm	12-21	Dull yellowish brown (10YR 4/3 m); silty clay; moderate, fine granular; slightly hard; very plastic; plentiful, fine to very fine roots; abrupt smooth boundary; 9 cm thick.
BCk	21-41	Dull yellow orange (10YR 6/3 m); silty clay; moderate to weak, very fine to fine granular; slightly hard; plastic; few, very fine to fine roots; clear, smooth boundary; 20 cm thick.
Ck	41+	Dull yellow orange (10YR 6/4 m); silty clay; weak, amorphous to very fine granular;slightly hard; plastic.

Site D - Orthic Black Chernozem

Horizon	Depth (cm)	Description
LF	4-0	Black; semidecomposed organic matter; abundant, very fine to medium roots; abrupt, smooth boundary; 4 cm thick.
Ah	0-10	Black (10YR 1.7/1 m, 10YR 3/2 d); loam; moderate to strong, very fine to fine granular; soft; non-plastic; abundant fine to very fine roots; abrupt, smooth boundary; 10 cm thick.
AB	10-39	Brownish black (10YR 3/2 m); silty clay loam; moderate, very fine to fine granular; soft; slightly plastic; plentiful fine to very fine roots; clear, smooth boundary; 29 cm thick.
BC	39-54	Dull yellowish brown (10YR 4/3 m); silty clay; moderate, fine granular; soft; plastic; few fine to very fine roots; abrupt, smooth boundary; 15 cm thick.
Ck	54+	Dull yellowish brown (10YR 5/3 m); silty clay; weak, very fine to fine granular; soft; plastic.

Site E - Gleyed Dark Brown Chernozem

Horizon	Depth (cm)	Description
LF	4-0	Black; semidecomposed organic matter; abundant, very fine to medium roots; abrupt, smooth boundary; 4 cm thick.
Ah	0-12	Brownish black (10YR 2/1 m, 10YR 4/2 d); sandy loam; weak, single grain; loose; non-plastic; abundant fine to very fine roots; abrupt, smooth boundary; 12 cm thick. *slight trace of mottling
Bmgj	12-23	Dark reddish brown or brownish black (5YR or 10YR 3/2 m), dull yellowish brown (10YR 5/3 d); sandy loam; common, medium, prominent reddish brown (5YR 5/8) mottles; single grain; loose; clear, smooth boundary; 11 cm thick.
Ckg$_{\mathrm{I}}$	23-36	Grayish yellow brown (10YR 4/2 m, 10YR 5/2 d); sandy loam; common, medium, prominent reddish brown (5YR 5/8) mottles; single grain; loose; clear, smooth boundary; 13 cm thick.
Ckg$_{\mathrm{II}}$	36+	Grayish yellow brown (10YR 6/2 m), dull yellow orange (10YR 7/2 d); silty clay loam; few, fine, distinct yellowish orange (7.5YR 7/8) mottles; amorphous, single grain; slightly hard; slightly plastic.

Appendix 2

Location of species subplots within treatment plots and site locations.

SITE A:
Order of treatment plots - WWC CCW

Plot AC1		Plot AC2		Plot AC3		Plot AW1		Plot AW2		Plot AW3	
Svld	Sco	At	Scu	Fh	Sv	Sv	Svld	Svld	Scu	Scu	Sv
Svld	Scu	Sv	At	Bi	Scu	Sco	Fh	Sv	Bi	Scu	Sco
Scu	Bi	Svld	Sco	Bi	Fh	Bi	Scu	At	Fh	At	Ad
Sv	Bi	Sv	Ad	Scu	Sco	At	At	Sco	Scu	Ad	Svld
At	Ad	Scu	Bi	Sv	Ad	Bi	Svld	At	Ad	Fh	Svld
Fh	Sv	Sco	Fh	Ad	Svld	Scu	Ad	Bi	Fh	Bi	Fh
At	Ad	Svld	Bi	Svld	At	Sco	Sv	Sv	Sco	Sv	Sco
Sco	Fh	Ad	Fh	At	Sco	Fh	Ad	Svld	Ad	At	Bi

SITE B:
Order of treatment plots - WCW CWC

Plot BC1		Plot BC2		Plot BC3		Plot BW1		Plot BW2		Plot BW3	
At	Scu	Sv	At	Fh	Sv	Fh	Svld	Bi	Ad	At	Bi
Bi	Bi	Sv	Scu	Scu	Svld	Svld	Sv	Fh	Sv	Svld	Sv
Scu	Sco	At	Fh	Bi	Sco	Bi	At	Scu	Sv	Scu	Sv
At	Ad	Svld	Sco	Scu	Fh	Scu	Ad	Bi	Svld	Fh	Svld
Sco	Ad	Fh	Bi	At	Ad	Bi	At	At	Fh	Ad	Sco
Svld	Fh	Scu	Sco	Sv	Svld	Sv	Ad	Sco	Scu	Ad	Scu
Sv	Svld	Bi	Ad	Bi	At	Scu	Sco	Ad	Svld	At	Sco
Fh	Sv	Svld	Ad	Sco	Ad	Fh	Sco	Sco	At	Bi	Fh

SITE C:
Order of treatment plots - WWC WCC

Plot CC1		Plot CC2		Plot CC3		Plot CW1		Plot CW2		Plot CW3	
Svld	Fh	Sv	Bi	Ad	At	Fh	At	Svld	Sco	Bi	Ad
Sco	Bi	Fh	Sco	Svld	At	Svld	Sco	Scu	Sv	At	Sco
Svld	Sco	Bi	Scu	Bi	Sv	At	Ad	Ad	Fh	Svld	Ad
Bi	Fh	Svld	Svld	Scu	Ad	Fh	Ad	At	Fh	At	Scu
At	Scu	Ad	Sco	Scu	Fh	Sv	Sco	Sco	Bi	Bi	Scu
At	Scu	At	Sv	Bi	Sco	Scu	Scu	Ad	Bi	Fh	Sv
Ad	Sv	Scu	Fh	Fh	Sv	Bi	Svld	Svld	At	Svld	Sv
Sv	Ad	Ad	At	Svld	Sco	Bi	Sv	Sv	Scu	Sco	Fh

SITE D:
Order of treatment plots - CCW WCW

Plot DC1		Plot DC2		Plot DC3		Plot DW1		Plot DW2		Plot DW3	
Fh	Bi	Ad	Scu	Scu	Svld	Sco	Bi	Scu	Bi	At	Bi
Fh	Sv	Svld	Ad	Ad	Bi	Fh	Ad	Sv	At	Fh	Ad
Bi	Svld	At	Sv	Sco	Sv	Sco	Sv	Sv	Ad	Sv	Fh
Scu	Ad	Bi	Sco	Svld	At	At	Scu	Svld	Sco	Scu	Sco
At	Sv	Scu	Sco	Scu	Fh	Svld	Sv	At	Bi	Bi	At
Ad	Scu	Sv	Bi	Sco	Sv	At	Scu	Svld	Sco	Ad	Sco
Sco	At	At	Fh	At	Fh	Fh	Ad	Fh	Scu	Scu	Svld
Sco	Svld	Svld	Fh	Ad	Bi	Bi	Svld	Ad	Fh	Sv	Svld

SITE E:
Order of treatment plots - WCW WCC

Plot EC1		Plot EC2		Plot EC3		Plot EW1		Plot EW2		Plot EW3	
At	Scu	Bi	Ad	Bi	Fh	Scu	Fh	Ad	Svld	Bi	Scu
Svld	Bi	Fh	Sv	Fh	Svld	Sv	Sco	At	Fh	Sco	Bi
Ad	Fh	At	Fh	Scu	At	Ad	Bi	Bi	Scu	Sco	Ad
Scu	Sco	Scu	Ad	Bi	Sco	Ad	At	Sv	Svld	At	Svld
Ad	Bi	At	Bi	Svld	Sv	Scu	Sco	Sco	Ad	Ad	At
Svld	Sv	Sv	Sco	Scu	Sco	Bi	At	Sv	At	Svld	Fh
Fh	Sv	Sco	Svld	Ad	At	Fh	Svld	Fh	Scu	Sv	Fh
At	Sco	Scu	Svld	Sv	Ad	Sv	Svld	Bi	Sco	Scu	Sv

Legend for Appendix 2:

W - irrigated
C - control (natural precipitation)

Ad - *Agropyron dasystachyum*
At - *Agropyron trachycaulum*
Bi - *Bromus inermis*
Fh - *Festuca hallii*
Sco - *Stipa comata*
Scu - *Stipa curtiseta*
Sv - *Stipa viridula*
Svld -*Stipa viridula* (Lodorm)

Appendix 3

Date of grass seed collection and location within the Last Mountain Lake National Wildlife Area for use in the field experiment.

Species	Date	Location
Agropyron dasystachyum	Aug. 2-9/88	NE29 28 23*
Agropyron trachycaulum	Aug. 2-9/88	NE29 28 23
Festuca hallii	Aug. 12/87	SW21 27 23
Stipa comata	July 22-30/88	NW33 28 23
Stipa curtiseta	Aug. 8-12/88	E20 28 23
Stipa viridula	July 21/88	NW33 28 23
Bromus inermis	Aug. 17/88	SE29 28 23

* Example: NE quarter of section 29, township 28, range 23 (all west of the second meridian)

Appendix 4

Comparison of daily precipitation and temperature between the study area (SA) and permanent Last Mountain Lake Climatological Station (HQ) during the field season in 1989. The two stations were ca. 9 km apart. Precipitation in the study area was collected at the ridgetop (top) and in the lowland (bottom). Temperature was collected at the ridgetop.

	Temperature (°C)				Precipitation (mm)		
	Maximum		Minimum			Study Area	
Date	HQ	SA	HQ	SA	HQ	top	bottom
May 11	29	-	13	-	5.2	5.9	-
12	20.5	-	11.5	-	21.2	15.9	16.7
13	22.4	-	11.5	-	0.4		
14	19	-	4.5	-			
15	22	-	4	-	11	4.9	6.4
16	21.5	-	12	-	0.4		
17	23	-	9.5	-		0.1	0.3
18	29	-	6.5	-	4.8	4.9	4.6
19	17.5	-	5.5	-			
20	15	-	4	-			
21	17	19	-1	-			
22	17	16.5	1	3.5	1	0.6	0.5
23	17	17.5	2.5	4	7.5	8.2	7.4
24	13.5	13	7.5	6.5	10	9	8.2
25	12	-	5	6.5		1.7	1.8
26	19		1	3			
27	18	19.5	5				
28	12.5		1	-0.5			
29	14.5		2				
30	20	20.5	4.5		1	0.4	0.4
31	22	21.5	2	1.5		0.5	0.6
				May Totals:	62.5	52.1	52.8
June 1	-	20.5	10.5	11		1.4	1
2	21.5	22	-	10.5	2		
3	22	24	4.5	7			
4	25	23.5	8.5	9			
5	25	26.5	8	11.5			
6	18	20.5	12	12.5	10	6.4	5.4
7	16	17.5	7.5	7.5			
8	21.5	22	5.5	2.5			
9	26		9.5	9	1.8	32.6	30.3
10	21	26.5	12.5		10.4		
11	13.5		12	7	11.2		
12	14.5		7.5				
13	20.5	20.5	1.5	1.5			
14	23	24	5.5	3.5			
15	23	30	13	13	3	2.05	1.54
16	29	26.5	16.5	18	4.2		
17	23	22.5	9	10.5			
18	26	26.5	8.5	10			
19	31.5	31.5	10	8	1.2	0.51	0.26
20	23	23	10	10.5			
21	20.5		7	6	0.08	0.85	2.05

	Temperature (°C)				Precipitation (mm)		
	Maximum		Minimum			Study Area	
Date	HQ	SA	HQ	SA	HQ	top	bottom
22	23.5	24	5.5				
23	20	20.5	10	11	1.6	1.28	0.72
24	19.5	20	6	5.5	6	28.72	28.72
25	14		9.5	10	10.4		
26	19	18	9.5				
27	23.5	23	8	5	0.04	<0.26	0.26
28	26	28	4	12			
29	30	29	10.5	11			
30	34	33.5	14	18.5			
				June Totals:	61.92	74.07	70.25
July 1	29.5	28.5	20	19.5			
2	27	27	14	11.5			
3	26	27	10.5	11.5			
4	32	32	15	16			
5	27	27	10	9		trace	
6	29	29	16	6 (error?)		trace	
7	32	33.5	12.5	11			
8	25.5	-	15.5	16.5	2	0.9	0.64
9	27.5	27	12	13			
10	24.5	24	9.5	11	16.4	15.64	15.13
11	25.5	26	14.5	14	0.4	6.92	6.41
12	23		10.5	11			
13	26		9				
14	26.5	30.5	15.5		0.6	1.02	0.77
15	29		14.5	11.5			
16	30.5	11.5					
17	31.5	31	15				
18	30.5	31.5	11	12.5			
19	33	33.5	14	13			
20	33	35.5	11.5	13.5			
21	35	36.5	20	21	trace	0.18	0.13
22	31	31.5	21	20.5			
23	31.5	35	6	6.5	trace		
24	35		15.5	14			
25	25.5	25	11		trace	0.26	<0.26
26	29	29.5	9.5	8			
27	21	-	6	6			
28	28		12	13	3.6		
29	29.5	32	12		3.08	3.08	
30	31.5		13	12.5			
31	35	35	18				
				July Totals:	23	28	26.42
Aug. 1	37.5	37	17.5	17.5			
2	33	33	22.5	22.5	trace	1.67	1.54
3	26	26	11	15.5	1.6		
4	24.5		12.5	13.5			
5	22	29.5	12				
6	25		2	1.5			
7	29		3				
8	31.5	32	8.5				
9	34	34	9	11			
10	35	36	16.5	17			

	Temperature (°C)				Precipitation (mm)		
	Maximum		Minimum			Study Area	
Date	HQ	SA	HQ	SA	HQ	top	bottom
11	34.5	35	12	12			
12	31.5	31.5	11.5	13			
13	24	-	12.5	11.5			
14	26	26.5	4	7			
15	29	29.5	8.5	7			
16	26.5	27.5	13.5	13.5	1.6	3.08	2.82
17	26.5	26	11	11	1	1.92	1.54
18	23.5	24.5	10	11	0.4	0.26	0.13
19	16.5	15	10	11			
20	23	31	8.5	8			
21	30.5		9.5	9.5			
22	29	31	11.5				
23	34	34	12.5	13			
24	28	28	15.5	16.5	4.8	7.44	7.44
25	16	17.5	13	14	5.2	5.9	-
26	20	21.5	10	11	0.8	0.13	-
27	21.5	21.5	7	7	5.2	3.59	-
28	19		10.5	6.5			
29	21	21	7.5	6		0.9	-
30	21.5	21.5	8.5	6.5	0.4	0.21	-
31	19	19.5	8.5	10			
				August Totals:	21	25.1	
Sept. 1	-	22.5	-	4.5			
2	-	29	-	10			
3	-	-	-	9.5		4.62	

Appendix 5

Table 1. Monthly means from 14 years (1976-1989) of precipitation and temperature data for Last Mountain Lake National Wildlife Area (Fig. II-2).

Month	Precipitation (mm)	Temperature (°C)
January	15.0	-16.3
February	10.5	-13.2
March	18.5	-5.9
April	20.7	4.7
May	56.0	12.0
June	55.4	16.4
July	51.2	19.1
August	28.2	17.4
September	32.0	11.3
October	17.4	4.7
November	14.4	-6.1
December	19.4	-14.7

Table 2. Monthly precipitation and mean temperatures during 1989, 1990, and 14 year average (1976-1989) at Last Mountain Lake National Wildlife Area and 39 year normals from Nokomis, SK (Fig. II-4 and 5).

	Precipitation (mm)				Temperature (°C)			
Month	1989	1990	14 yr.	39 yr.	1989	1990	14 yr.	39 yr.
January	24.0	15.2	15.0	18.6	-14.6	-12.0	-16.3	-18.2
February	5.0	4.4	10.5	11.5	-19.1	-14.5	-13.2	-14.3
March	12.4	16.0	18.5	15.1	-11.0	-1.0	-5.9	-8.0
April	16.0	14.8	20.7	22.0	4.1	4.0	4.7	3.5
May	68.4	12.4	56.0	42.5	11.7	10.5	12.0	11.1
June	63.0	61.4	55.4	68.1	15.9	16.0	16.4	15.8
July	23.0	74.0	51.2	56.6	20.9	18.2	19.1	18.4
August	21.0	19.2	28.2	42.0	18.5	18.3	17.4	17.3
September	40.4	0	32.0	42.9	11.7	13.6	11.3	10.9
October	21.2	2.2	17.4	20.8	4.8	1.1	4.7	4.6
November	35.7	1.6	14.4	12.4	-5.4	-7.1	-6.1	-5.9
December	25.2	23.4	19.4	15.1	-16.5	-17.5	-14.7	-14.0

Table 3. Mean (%) and standard error (in brackets) of soil moisture content (percentage of soil dry weight) from surface (S, 0-5 cm) and deep (D, 10-15 cm) soil strata exposed to given pressure potentials (Fig. II-8).

Pressure		Site				
(-MPa)	Depth	A	B	C	D	E
0.01	S	30.5(.85)	29.2(.21)	23.2(.86)	29.7(.77)	20.3(.13)
	D	29.9(1.4)	28.3(.16)	22.8(.79)	30.8(1.42)	20.3(.66)
0.02	S	21.1(.68)	16.0(.07)	19.6(.69)	22.8(.07)	16.2(.12)
	D	21.7(1.2)	16.2(.18)	19.9(.64)	23.7(.35)	16.5(.56)
0.05	S	18.1(.17)	16.2(.22)	17.4(1.09)	19.3(.54)	14.6(.01)
	D	18.2(.4)	15.9(.34)	17.4(.8)	19.3(.75)	14.4(.67)
0.075	S	15.8(.3)	15.0(.45)	13.8(.37)	15.9(.14)	13.1(.07)
	D	16.4(.53)	15.0(.5)	14.3(.32)	16.3(.31)	13.0(.69)
0.1	S	14.2(.23)	12.2(.18)	12.3(.19)	14.7(.06)	12.2(.04)
	D	14.6(.4)	12.4(.18)	13.0(.2)	14.9(.35)	12.0(.59)
0.2	S	12.1(.26)	9.7(.04)	11.0(.16)	13.2(.12)	11.9(.4)
	D	12.1(.4)	9.8(.17)	11.2(.12)	12.8(.43)	11.2(.17)
0.35	S	11.7(.26)	9.3(.07)	10.2(.04)	12.5(.15)	11.2(.27)
	D	11.8(.31)	9.2(.11)	10.2(.04)	12.0(.37)	10.1(.22)
0.5	S	11.0(.21)	8.4(.07)	10.0(.22)	12.3(.12)	11.0(.27)
	D	11.2(.28)	8.4(.15)	10.1(.23)	12.2(.33)	10.1(.27)
0.75	S	11.3(.2)	9.0(.09)	9.9(.11)	-	-
	D	11.2(.28)	8.9(.15)	9.4(.12)	-	-
1.0	S	11.4(.24)	9.0(.13)	9.8(.1)	11.9(.18)	10.9(.33)
	D	11.3(.37)	8.7(.15)	9.5(.05)	11.4(.39)	9.4(.11)
1.25	S	11.6(.25)	8.8(.07)	9.9(.08)	-	-
	D	11.3(.38)	8.4(.14)	9.3(.19)	-	-
1.5	S	10.6(.21)	7.8(.11)	8.4(.14)	10.8(.17)	9.9(.32)
	D	10.6(.21)	7.8(.26)	8.3(.12)	10.2(.31)	8.52(.15)

Table 4. Mean (%) and standard error (in brackets) of the moisture content (percentage of soil dry weight) of soil cores from five sites along the topographic gradient. Cores collected from surface (S, 0-5 cm) and deep (D, 10-15 cm) soil strata within control moisture treatment plots during a period with no precipitation after a thoroughly soaking rain (Day 0) (Fig. II-9).

		Site				
Day	Depth	A	B	C	D	E
1	S	24.6(.96)	21.7(.24)	19.2(.47)	26.5(.53)	18.9(.61)
	D	21.9(.89)	21.3(.55)	18.2(.86)	28.6(.72)	23.3(1.1)
3	S	15.7(.91)	14.6(.42)	11.3(.62)	16.5(.66)	13.2(.7)
	D	18.5(1.16)	18.8(.56)	16.7(.61)	25.5(.47)	18.8(.53)
5	S	11.5(.8)	11.3(.36)	9.4(.95)	12.5(.64)	10.5(.55)
	D	17.2(.65)	16.4(.36)	16.1(.39)	23.4(.5)	18.3(.6)
7	S	11.2(.93)	10.4(.33)	8.8(.42)	13.5(.58)	10.5(1.1)
	D	14.8(.85)	15.4(.42)	14.0(.55)	21.8(.82)	17.5(.71)
12	S	6.6(.54)	7.0(.57)	4.7(.62)	7.9(.59)	3.9(.45)
	D	12.6(.98)	12.5(.71)	13.2(.95)	19.1(.73)	17.0(1.1)
33	S	2.8(.2)	2.5(.1)	2.8(.14)	3.2(.13)	3.0(.27)
	D	6.7(.6)	5.3(.3)	7.9(.47)	7.6(.24)	8.7(1.2)

Table 5. Proportional composition of surface (0-15 cm) soil texture from sites along the topographic gradient (Fig. II-10).

	Site				
Texture	A	B	C	D	E
Sand	56.8(.8)	59.4(.57)	57.2(.88)	47.9(.54)	65.7(3.3)
Silt	24.3(1.1)	22.5(.43)	22.0(.24)	30.4(.43)	16.8(1.3)
Clay	18.9(.69)	18.2(.24)	20.8(.91)	21.8(.17)	17.5(2.1)

Table 6. May 1989 soil chemical properties of surface soil samples (0-15 cm) at sites along the topographic gradient (Fig. II-11).

	Site				
Property	A	B	C	D	E
pH (H_2O)	7.7(.12)	6.9(0.0)	7.2(.04)	7.0(.12)	8.0(.07)
pH ($CaCl_2$)	7.2(.11)	6.5(.03)	6.7(.02)	6.5(.09)	7.7(.05)
Electrical Conductivity EC (mS/cm)	.22(.02)	.18(.01)	.15(.02)	.21(.01)	1.6(.74)
NO_3 (μg/g)	27.2(2.1)	32.0(1.2)	19.4(3.5)	22.5(3.0)	15.7(3.3)
NH_4 (μg/g)	3.8(.1)	4.2(.6)	3.8(.58)	5.0(.89)	5.6(.25)
PO_4 (μg/g)	13.6(.5)	10.8(.5)	9.8(1.1)	7.9(.1)	3.0(.86)
Ca (μg/g)	2807.0 (171.0)	1977.5 (18.5)	2111.5 (26.5)	2859.5 (34.5)	5677.0 (818.0)
Mg (μg/g)	668.5(4.5)	588.0(154)	482.0(21)	529.0(5.0)	831.0(19)
Na (μg/g)	2.5(2.5)	42.0(30)	7.5(2.5)	40.0(15)	396(221)
K (μg/g)	598.0(20)	448.5(8.5)	441.5(31.5)	597.0(71)	370.5(13)
Total %C	2.9(.09)	2.0(.04)	1.8(.03)	2.8(.1)	3.0(.37)
Total %N	.26(.01)	.19(.01)	.18(.0)	.26(.02)	.23(.0)
Total %P	.06(.01)	.05(.01)	.05(.0)	.05(.0)	.05(.0)
%Inorg. C	.15(.09)	0.0	0.0	0.0	.85(.37)

Table 7. Mean (%) and standard error (in brackets) of total germination during 1989 under control (C) and irrigated (I) moisture treatments at five locations along the topographic gradient (Fig. II-12).

		Site				
Species	Treatment	A	B	C	D	E
Agropyron dasystachyum	C	72.5(5.4)	76.2(1.2)	71.6(3.6)	80.0(1.9)	78.2(2.2)
	I	81.8(2.1)	82.5(2.6)	81.4(3.1)	76.7(2.2)	80.7(2.1)
Agropyron trachycaulum	C	80.0(2.2)	81.5(1.8)	77.1(.93)	81.9(2.2)	80.9(3.8)
	I	85.8(2.1)	82.9(1.8)	84.7(2.0)	81.6(2.4)	82.7(1.8)
Bromus inermis	C	92.5(1.8)	92.7(1.9)	86.9(2.8)	92.0(2.5)	87.1(1.4)
	I	94.5(1.4)	95.3(.89)	93.8(.57)	94.0(2.0)	93.3(1.3)
Festuca hallii	C	47.6(4.1)	63.4(3.8)	20.2(8.6)	54.1(5.4)	39.3(3.5)
	I	68.3(1.2)	73.8(2.7)	65.8(3.7)	75.6(3.6)	71.1(5.4)
Stipa comata	C	11.8(1.3)	8.4(1.6)	9.8(2.0)	18.5(3.4)	22.9(2.6)
	I	13.3(1.6)	11.6(1.4)	16.2(1.7)	15.1(1.2)	29.1(2.9)
Stipa curtiseta	C	32.9(3.3)	37.1(2.6)	33.8(2.2)	33.8(2.7)	32.2(1.7)
	I	43.8(2.5)	46.7(2.7)	45.6(1.4)	39.6(1.6)	35.1(2.2)
Stipa viridula	C	2.7(1.1)	3.3(0.8)	0.9(0.5)	1.1(0.5)	2.2(0.5)
	I	2.2(0.6)	6.2(1.7)	2.9(1.2)	1.5(0.2)	3.8(1.3)
Stipa viridula (Lodorm)	C	14.9(1.9)	33.1(1.6)	20.7(4.0)	29.6(3.2)	19.1(2.9)
	I	28.7(3.0)	34.4(2.2)	28.2(2.4)	35.8(1.6)	40.9(3.0)

Table 8. Mean and standard error (in brackets) of total germination (percentage of original 75 seeds planted) during the second field season (17 May to 30 July, 1990) from control and previously irrigated moisture treatments at sites along the topographic gradient (Fig. II-13).

		Site				
Species	Treatment	A	B	C	D	E
Stipa comata	C	31.3(4.2)	36.4(3.5)	38.9(3.8)	46.9(1.7)	52.2(2.9)
	I	20.4(3.3)	18.2(2.4)	22.7(2.2)	28.9(3.5)	37.1(3.9)
Stipa curtiseta	C	2.7(0.7)	8.2(0.7)	6.0(2.0)	7.8(2.2)	7.6(1.3)
	I	2.9(0.5)	5.1(0.9)	3.3(0.6)	5.3(1.3)	5.8(1.4)
Stipa viridula	C	7.6(1.9)	40.4(5.3)	43.3(5.6)	30.7(7.6)	31.8(4.8)
	I	5.8(1.5)	34.9(6.1)	33.8(4.2)	28.4(2.5)	21.3(9.8)

Table 9. Mean and standard error (in brackets) of the number of new germinants at each cohort count date (1989/1990) for moisture treatments plots (irrigation treatment occurred in 1989 only) from all five topographic gradient locations (Fig. II-14).

		Moisture treatment	
Species	Count Date	Control	Irrigated
Agropyron dasystachyum	June 5	44.8(1.8)	56.6(.86)
	June 13	6.3(.78)	3.1(.36)
	June 26	5.5(.83)	0.7(.16)
	July 4	0.17(.08)	0.03(.03)
	July 18	0.1(.06)	0.17(.07)
	July 26	0.07(.05)	0.03(.03)
	August 10	0	0
	September 3	0	0

		Moisture treatment	
Species	Count Date	Control	Irrigated
Agropyron trachycaulum	June 5	35.1(3.1)	57.5(.83)
	June 13	16.4(2.1)	4.4(.68)
	June 26	8.5(1.6)	0.67(.17)
	July 4	0.14(.07)	0
	July 18	0	0.03(.03)
	July 26	0.03(0.03)	0
	August 10	0	0
	September 3	0	0

Species	Count Date	Moisture treatment	
		Control	Irrigated
Bromus inermis	June 5	44.3(3.0)	64.4(1.0)
	June 13	9.7(.97)	5.3(.73)
	June 26	13.2(1.71)	0.9(.18)
	July 4	0.43(.11)	0
	July 18	0.07(.05)	0
	July 26	0	0
	August 10	0	0
	September 3	0	0

Species	Count Date	Moisture treatment	
		Control	Irrigated
Festuca hallii	June 5	0.52(.21)	5.3(.6)
	June 13	17.8(2.5)	42.5(1.6)
	June 26	14.8(1.6)	5.3(.91)
	July 4	0.34(.13)	0.03(.03)
	July 18	0	0.03(.03)
	July 26	0	0
	August 10	0	0
	September 3	0	0

		Moisture treatment	
Species	Count Date	Control	Irrigated
Stipa comata	June 5	1.5(.26)	3.3(.46)
	June 13	0.23(.09)	1.6(.25)
	June 26	6.5(.73)	6.0(.64)
	July 4	1.2(.33)	1.1(.2)
	July 18	0.8(.16)	0.57(.18)
	July 26	0.07(.05)	0
	August 10	0	0
	September 3	0.37(.12)	0.07(.05)
	/ May 17	29.9(1.5)	17.9(1.4)
	May 29	0.8(.23)	0.9(.23)
	July 26	0.13(.06)	0.23(.09)

		Moisture treatment	
Species	Count Date	Control	Irrigated
Stipa curtiseta	June 5	6.5(.91)	14.8(1.3)
	June 13	1.6(.25)	7.8(.61)
	June 26	12.6(.69)	7.0(.66)
	July 4	2.7(.39)	1.3(.26)
	July 18	1.3(.38)	0.3(.13)
	July 26	0.1(.06)	0.07(.05)
	August 10	0	0
	September 3	0.6(.15)	0.33(.11)
	/ May 17	4.2(.48)	2.8(.32)
	May 29	0.6(.18)	0.43(.16)
	July 26	0.03(.03)	0.1(.06)

Species	Count Date	Moisture treatment	
		Control	Irrigated
Stipa viridula	June 5	0.37(.11)	0.67(.19)
	June 13	0.27(.08)	0.17(.07)
	June 26	0.53(.15)	1.1(.34)
	July 4	0.2(.09)	0.33(.11)
	July 18	0.03(.03)	0.17(.07)
	July 26	0	0
	August 10	0	0.03(.03)
	September 3	0	0.33(.03)
	/ May 17	20.9(2.3)	16.8(2.3)
	May 29	0.23(.11)	0.3(.11)
	July 26	2.0(.45)	1.5(.32)

Species	Count Date	Moisture treatment	
		Control	Irrigated
Stipa viridula (Lodorm)	June 5	14.0(1.3)	22.9(.97)
	June 13	1.6(.2)	1.7(.29)
	June 26	1.8(.29)	0.37(.1)
	July 4	0.13(.06)	0.07(.05)
	July 18	0.03(.03)	0.07(.05)
	July 26	0	0
	August 10	0	0
	September 3	0.1(.06)	0

Table 10. Mean and standard error (in brackets) of total germination during the first two years (1989 and 1990) under control and irrigation (active in 1989 only) moisture treatments at five sites along the topographic gradient (Fig. II-15).

		Site				
Species	Treatment	A	B	C	D	E
Agropyron dasystachyum	C	72.4(5.4)	76.2(1.2)	71.6(3.6)	80.0(1.9)	78.2(2.2)
	I	81.8(2.1)	82.5(2.6)	81.3(3.1)	76.7(2.2)	80.7(2.1)
Agropyron trachycaulum	C	80.0(2.2)	81.5(1.8)	77.1(0.9)	81.9(2.2)	80.9(3.8)
	I	85.8(2.1)	82.9(1.8)	84.7(2.0)	81.6(2.4)	82.7(1.8)
Bromus inermis	C	92.5(1.8)	92.7(1.9)	86.9(2.8)	92.0(2.5)	87.1(1.4)
	I	94.5(1.4)	95.3(0.9)	93.8(0.6)	94.0(2.0)	93.3(1.3)
Festuca hallii	C	47.6(4.1)	63.4(3.8)	20.2(8.6)	54.1(5.4)	39.3(3.5)
	I	68.3(1.2)	73.8(2.7)	65.8(3.7)	75.6(3.6)	71.1(5.4)
Stipa comata	C	43.1(3.9)	44.9(4.1)	48.7(2.9)	65.3(3.2)	75.1(2.6)
	I	33.8(4.2)	29.8(2.5)	38.9(2.9)	44.0(4.6)	66.2(4.8)
Stipa curtiseta	C	35.6(3.0)	45.3(3.1)	39.8(3.2)	41.6(3.8)	39.8(1.8)
	I	46.7(2.8)	51.8(2.8)	48.9(1.5)	44.9(1.5)	40.9(2.0)
Stipa viridula	C	10.2(2.9)	43.8(5.7)	44.2(5.6)	31.8(8.0)	34.0(5.0)
	I	8.0(1.6)	41.1(7.1)	36.7(5.0)	30.0(2.4)	25.1(10.6)
Stipa viridula (Lodorm)	C	14.9(1.9)	33.1(1.6)	20.7(4.0)	29.6(3.2)	19.1(2.9)
	I	28.7(3.0)	34.4(2.2)	28.2(2.4)	35.8(1.6)	40.9(3.0)

Table 11. Mean and standard error (in brackets) of total survivorship (percentage of number of germinants) at the end (3 Sept.) of the 1989 field season (first growing season) under control and irrigated moisture treatments at five sites along the topographic gradient (Fig. II-16).

		Site				
Species	Treatment	A	B	C	D	E
Agropyron	C	87.2(3.0)	91.3(2.3)	87.4(2.8)	98.9(0.4)	90.0(1.8)
dasystachyum	I	94.3(1.7)	96.3(0.5)	96.6(1.7)	97.3(0.6)	97.5(1.0)
Agropyron	C	94.6(1.5)	77.4(5.6)	81.3(4.3)	99.0(0.7)	96.0(1.4)
trachycaulum	I	97.9(0.7)	98.6(0.5)	98.1(0.3)	100(0)	98.3(0.8)
Bromus	C	88.1(2.3)	86.0(4.4)	89.4(4.1)	97.2(1.0)	95.1(2.0)
inermis	I	98.8(0.7)	99.1(0.7)	99.1(0.5)	99.1(0.5	99.3(0.5)
Festuca	C	24.1(5.7)	43.5(6.0)	18.3(6.8)	50.3(7.3)	25.6(4.8)
hallii	I	68.8(7.2)	76.6(9.4)	59.7(4.2)	83.6(2.1)	71.9(8.4)
Stipa	C	95.2(3.4)	94.0(2.8)	87.4(4.8)	87.6(4.9)	93.5(1.6)
comata	I	91.0(3.1)	96.5(2.2)	98.7(1.3)	92.6(2.5)	95.9(1.4)
Stipa	C	97.6(1.2)	96.3(1.4)	92.2(3.4)	100(0)	94.5(1.5)
curtiseta	I	97.6(0.9)	99.0(0.6)	98.5(1.1)	100(0)	96.5(2.3)
Stipa	C	62.5(20.2)	83.3(16.7)	33.3(21.1)	50.0(22.4)	58.3(20.1)
viridula	I	83.3(16.7)	100(0)	83.3(16.7)	100(0)	81.0(16.4)
Stipa	C	96.7(3.3)	95.0(4.3)	96.4(2.3)	99.3(0.7)	97.2(1.8)
viridula (Lodorm)	I	90.8(3.7)	98.4(1.0)	96.3(1.8)	98.0(0.9)	97.3(0.6)

Table 12. Mean and standard error (in brackets) of the number of germinants in select cohorts surviving at each subsequent count date in 1989/1990 within the control moisture treatment only from all five topographic gradient sites (Fig. II-17).

Species	Count Date	Cohort 1	Cohort 2	Cohort 3	Cohort 4
Agropyron dasystachyum	June 5	44.4(1.8)			
	June 13	44.4(1.8)	6.2(.77)		
	June 26	44.2(1.8)	6.0(.78)	6.4(.83)	
	July 4	44.0(1.8)	5.8(.74)	6.0(.81)	1.2(.20)
	July 18	43.9(1.8)	5.6(.69)	5.4(.77)	1.0(.32)
	July 26	43.7(1.9)	5.4(.67)	5.2(.74)	1.0(.32)
	August 10	43.3(1.9)	5.3(.67)	4.6(.65)	1.0(.32)
	August 19	42.8(1.9)	4.8(.71)	4.3(.58)	1.0(.32)
	/ July 26	43.2(1.9)	4.9(.66)	4.4(.62)	1.0(.41)

Species	Count Date	Cohort 1	Cohort 2	Cohort 3	Cohort 4
Agropyron trachycaulum	June 5	35.0(3.1)			
	June 13	35.0(3.1)	17.0(2.1)		
	June 26	34.4(3.0)	16.7(2.1)	9.5(1.7)	
	July 4	34.2(3.0)	16.4(2.0)	9.1(1.6)	1.0(0)
	July 18	34.1(3.0)	16.2(2.0)	8.6(1.5)	0.75(.25)
	July 26	34.0(2.0)	16.1(1.9)	8.5(1.5)	0.75(.25)
	August 10	33.9(3.0)	15.8(1.9)	7.9(1.4)	0.5(.29)
	August 19	32.5(2.8)	15.1(2.0)	7.0(1.2)	0.5(.29)
	/ July 26	32.9(2.8)	15.1(2.0)	7.0(1.2)	0.25(.25)

Species	Count Date	Cohort 1	Cohort 2	Cohort 3	Cohort 4
Bromus inermis	June 5	44.0(3.0)			
	June 13	44.0(3.0)	9.7(.97)		
	June 26	43.6(3.0)	9.6(.95)	14.1(1.7)	
	July 4	43.5(3.0)	9.5(.96)	14.0(1.7)	1.2(.12)
	July 18	43.4(3.0)	9.3(.94)	13.5(1.6)	1.0(.13)
	July 26	43.4(3.0)	9.3(.94)	13.4(1.6)	0.91(.09)
	August 10	43.3(3.0)	9.2(.94)	13.4(1.6)	0.91(.09)
	August 19	41.2(2.9)	8.7(.96)	12.0(1.5)	0.64(.15)

Species	Count Date	Cohort 1	2	3	4
Festuca hallii	June 5	2.1(.51)			
	June 13	2.1(.51)	18.4(2.5)		
	June 26	2.1(.51)	17.2(2.4)	14.8(1.6)	
	July 4	2.1(.51)	15.4(2.4)	10.7(1.3)	1.4(.3)
	July 18	2.1(.51)	13.1(2.2)	7.6(1.2)	0.43(.2)
	July 26	2.1(.51)	12.3(2.1)	6.5(1.1)	0.43(.2)
	August 10	2.0(.53)	10.0(1.8)	4.4(.75)	0.14(.14)
	August 19	2.0(.53)	8.8(1.7)	4.4(.75)	0.14(.14)
	/ May 17	1.9(.55)	8.1(1.4)	3.3(.68)	0.14(.14)
	July 26	1.6(.65)	6.5(1.2)	2.5(.55)	0.14(.14)

Stipa comata:

Count Date	Cohort 1	2	3	4	5	8	9
Jn 5	2.0(.27)						
Jn 13	2.0(.27)	1.2(.17)					
Jn 26	1.9(.25)	1.2(.17)	6.7(.72)				
Jl 4	1.9(.26)	1.2(.17)	6.4(.71)	2.5(.51)			
Jl 18	1.9(.26)	1.2(.17)	6.4(.71)	2.4(.45)	1.5(.16)		
Jl 26	1.9(.26)	1.2(.17)	6.4(.71)	2.4(.45)	1.4(.18)		
A 10	1.9(.26)	1.2(.17)	6.4(.71)	2.4(.45)	1.4(.18)		
A 19	1.8(.27)	1.2(.17)	6.3(.71)	2.3(.47)	1.4(.18)		
S 3						1.2(.22)	
/M 17					1.3(.17)	1.2(.22)	29.9(1.5)
M 29							27.5(1.5)
Jl 26	1.8(.25)	1.2(.17)	6.3(.71)	2.4(.45)	1.3(.17)	1.0(0)	21.8(1.5)

Stipa curtiseta:

Count Date	Cohort 1	2	3	4	5	8	9
Jn 5	7.5(.89)						
Jn 13	7.5(.89)	2.2(.24)					
Jn 26	7.5(.89)	2.2(.24)	12.6(.69)				
Jl 4	7.5(.89)	2.2(.24)	12.6(.69)	3.1(.39)			
Jl 18	7.5(.89)	2.2(.24)	12.5(.68)	3.0(.35)	2.7(.58)		
Jl 26	7.5(.89)	2.2(.24)	12.5(.68)	2.9(.35)	2.3(.57)		
A 10	7.5(.89)	2.2(.24)	12.5(.7)	2.9(.35)	1.9(.47)		
A 19	7.5(.89)	2.2(.24)	12.4(.7)	2.8(.35)	1.8(.43)		
S 3						1.4(.18)	
/M 17				2.8(.35)	1.8(.44)	1.2(.17)	4.7(.45)
M 29							4.4(.42)
Jl 26	7.5(.89)	2.2(.24)	12.4(.7)	2.8(.35)	1.7(.44)	1.2(.17)	3.3(.4)

Stipa viridula:

Count Date	Cohort 1	2	3	4	9
June 5	1.2(.15)				
June 13	1.2(.15)	1.0(0)			
June 26	1.1(.2)	1.0(0)	1.5(.21)		
July 4	1.1(.2)	0.88(.13)	1.5(.21)	1.2(.2)	
July 18	1.1(.2)	0.88(.13)	1.4(.24)	1.2(.2)	
July 26	1.1(.2)	0.88(.13)	1.4(.24)	1.2(.2)	
August 10	1.1(.2)	0.88(.13)	1.4(.24)	1.2(.2)	
August 19	1.1(.2)	0.88(.13)	1.4(.24)	1.2(.2)	
/May 17	1.1(.2)	0.88(.13)	1.4(.24)	1.2(.2)	21.6(2.3)
May 29					18.1(2.1)
July 26	1.1(.2)	0.88(.13)	1.4(.24)	1.2(.2)	12.2(1.9)

Species	Count Date	Cohort			
		1	2	3	4
Stipa	June 5	13.7(1.3)			
viridula	June 13	13.7(1.3)	2.1(.15)		
(Lodorm)	June 26	13.4(1.3)	2.1(.15)	2.3(.29)	1.0(0)
	July 4	13.3(1.2)	2.1(.15)	2.2(.29)	1.0(0)
	July 18	13.3(1.3)	2.1(.15)	2.2(.29)	0.75(.25)
	July 26	13.3(1.3)	2.1(.15)	2.2(.29)	0.75(.25)
	August 10	13.3(1.3)	2.1(.15)	2.2(.29)	0.75(.25)
	August 19	13.3(1.3)	2.1(.15)	2.2(.29)	0.75(.25)
	/ May 17		2.1(.17)	2.2(.29)	0.75(.25)
	July 26	13.2(1.2)	2.0(.16)	2.1(.27)	0.75(.25)

Table 13. Mean and standard error (in brackets) of total 1990 survivorship (percentage of the number of 1990 germinants) at the end of the 1990 field season (30 July) within the control and previously irrigated moisture treatments at sites along the topographic gradient (Fig. II-18).

Species	Treatment	Site				
		A	B	C	D	E
Stipa	C	57.5(6.6)	77.6(3.9)	71.6(4.4)	71.7(4.5)	79.4(5.1)
comata	I	45.7(9.5)	63.2(6.8)	63.6(7.4)	43.1(6.3)	54.4(4.6)
Stipa	C	80.0(13.3)	76.4(10.2)	92.0(8.0)	61.5(12.0)	70.5(6.1)
curtiseta	I	63.9(15.2)	52.2(4.9)	70.8(14.2)	71.0(11.5)	68.2(13.0)
Stipa	C	37.0(15.8)	63.5(6.7)	82.5(3.6)	30.0(8.3)	57.7(9.5)
viridula	I	52.6(18.3)	45.2(7.7)	65.2(6.5)	55.9(4.9)	60.8(13.9)

Table 14. Mean and standard error (in brackets) of total survivorship of 1989 survivors (19 August) at the end of the 1990 field season (30 July) within the control and previously irrigated moisture treatments at sites along the topographic gradient (Fig. II-19).

		Site				
Species	Treatment	A	B	C	D	E
Agropyron dasystachyum	C	102.3(1.0)	102.7(1.1)	102.1(2.6)	100.0(.4)	99.4(1.3)
	I	100.6(.7)	100.3(.3)	100.0(.5)	100.0(0)	100.3(.3)
Agropyron trachycaulum	C	99.4(.6)	105.5(4.9)	101.2(2.3)	99.7(.3)	98.5(.8)
	I	100.0(0)	100.0(0)	100.0(0)	99.7(.3)	100.0(0)
Festuca hallii	C	78.4(11.0)	72.8(5.4)	79.4(10.6)	68.4(9.1)	102.8(20.1)
	I	61.5(6.6)	83.5(.9)	77.3(4.7)	77.3(10.1)	72.5(4.7)
Stipa comata	C	98.5(1.5)	102.8(2.8)	99.5(3.3)	99.1(.9)	103.5(1.8)
	I	93.8(6.3)	100.0(0)	100.0(0)	98.6(1.4)	92.8(4.5)
Stipa curtiseta	C	100.6(.6)	99.6(1.2)	98.0(1.5)	100.0(0)	99.0(1.8)
	I	97.8(1.4)	98.0(1.5)	98.6(.7)	99.4(.6)	99.1(.9)
Stipa viridula	C	100.0(0)	100.0(0)	100.0(0)	100.0(0)	100.0(0)
	I	100.0(0)	100.0(0)	80.0(20)	100.0(0)	100.0(0)
Stipa viridula (Lodorm)	C	98.6(1.4)	100.0(0)	100.0(0)	100.0(0)	98.4(1.6)
	I	100.0(0)	100.0(0)	100.0(0)	100.0(0)	100.0(0)

Table 15. Mean and standard error (in brackets) of total survivorship (percentage of total number of germinants) at the end of the second field season (30 July 1990) under control and first year irrigation moisture treatments at locations along the topographic gradient (Fig. II-20).

		Site				
Species	Treatment	A	B	C	D	E
Agropyron dasystachyum	C	88.7(3.7)	92.5(2.3)	87.9(2.0)	98.9(.56)	89.2(2.2)
	I	93.6(2.0)	93.8(.51)	94.9(2.5)	94.8(1.0)	97.8(.82)
Agropyron trachycaulum	C	94.0(1.2)	80.4(3.3)	81.6(3.0)	98.1(.79)	94.6(1.7)
	I	95.3(1.2)	94.6(.97)	97.1(.62)	97.8(.83)	97.3(1.2)
Festuca hallii	C	18.9(5.4)	31.7(5.0)	14.0(5.3)	32.8(5.2)	24.5(4.3)
	I	43.2(8.1)	63.8(7.8)	46.3(4.6)	65.1(9.1)	53.4(7.9)
Stipa comata	C	68.6(4.6)	80.6(3.2)	74.5(3.8)	77.6(2.1)	84.9(3.1)
	I	61.1(6.3)	76.9(4.0)	78.9(3.5)	60.1(4.9)	69.7(4.6)
Stipa curtiseta	C	95.2(2.3)	92.5(2.0)	90.6(3.6)	92.3(3.2)	89.1(1.9)
	I	92.9(.63)	92.7(2.0)	94.5(.98)	96.0(1.6)	89.4(3.7)
Stipa viridula	C	49.2(14.4)	66.8(5.6)	82.1(3.7)	32.0(7.8)	57.0(9.2)
	I	61.7(15.5)	53.4(7.7)	67.2(6.0)	58.4(4.6)	64.4(10.6)
Stipa viridula (Lodorm)	C	95.3(3.3)	92.3(4.5)	95.5(2.2)	98.6(.86)	93.4(2.7)
	I	83.8(5.4)	91.3(2.3)	93.0(2.6)	95.5(1.8)	96.1(.68)

Table 16. Mean and standard error (in brackets) of the total number of individuals surviving at the end of the second field season (30 July 1990) under control and first year irrigation moisture treatments at sites along the topographic gradient (Fig. II-21).

		Site				
Species	Treatment	A	B	C	D	E
Agropyron	C	48.7(4.7)	52.8(1.4)	47.3(3.1)	59.3(1.5)	52.3(1.9)
dasystachyum	I	57.5(2.4)	58.0(1.9)	57.8(2.6)	54.5(1.5)	59.3(1.9)
Agropyron	C	56.3(1.4)	49.2(2.2)	47.2(1.7)	60.2(1.6)	57.3(2.7)
trachycaulum	I	61.3(1.9)	58.8(1.7)	61.7(1.5)	59.8(2.1)	60.3(1.4)
Festuca	C	7.3(2.7)	15.3(2.6)	2.3(1.1)	13.2(2.5)	7.2(1.1)
hallii	I	27.8(6.6)	34.8(4.0)	22.8(2.7)	36.0(4.6)	30.0(5.9)
Stipa	C	21.8(1.9)	26.8(2.1)	27.5(2.6)	37.8(1.3)	47.8(2.3)
comata	I	15.3(2.3)	17.2(1.6)	23.0(2.0)	19.7(2.4)	35.2(4.3)
Stipa	C	25.5(2.4)	31.3(1.9)	27.3(3.1)	28.8(2.7)	26.7(1.7)
curtiseta	I	32.5(1.8)	35.8(1.3)	34.7(1.2)	32.3(1.3)	27.5(1.8)
Stipa	C	3.7(.92)	22.5(3.9)	27.3(3.6)	8.3(4.2)	13.8(2.7)
viridula	I	4.2(1.1)	16.0(3.6)	18.5(3.0)	13.3(1.9)	10.8(4.6)
Stipa	C	10.5(1.5)	23.0(1.8)	14.7(2.6)	21.8(2.6)	13.2(1.7)
viridula (Lodorm)	I	18.2(2.4)	23.5(1.3)	19.8(2.0)	25.7(1.4)	29.5(2.3)

Table 17. Least-squares mean and standard error (in brackets) of individual above-ground dry weight (g) at the end of the first growing season (1989) within control and irrigated moisture treatments at sites along the topographic gradient (Fig. II-22).

		Site				
Species	Treatment	A	B	C	D	E
Agropyron dasystachyum	C	0.11(.02)	0.14(.02)	0.28(.03)	0.43(.05)	0.18(.02)
	I	0.21(.02)	0.28(.02)	0.27(.03)	0.46(.05)	0.22(.02)
Agropyron trachycaulum	C	0.22(.03)	0.24(.03)	0.23(.04)	0.34(.06)	0.29(.04)
	I	0.25(.03)	0.31(.03)	0.25(.04)	0.58(.04)	0.48(.04)
Bromus inermis	C	0.20(.03)	0.22(.03)	0.47(.05)	0.76(.06)	0.50(.04)
	I	0.51(.03)	0.44(.03)	0.47(.05)	0.76(.06)	0.31(.04)
Festuca hallii	C	.012(.002)	.011(.002)	.005(.004)	.012(.002)	.003(.003)
	I	.016(.001)	.021(.002)	.017(.002)	.026(.002)	.024(.002)
Stipa comata	C	0.17(.02)	0.14(.03)	0.13(.02)	0.11(.04)	0.06(.01)
	I	0.1(.02)	0.16(.02)	0.13(.01)	0.25(.03)	0.11(.01)
Stipa curtiseta	C	0.18(.02)	0.12(.02)	0.27(.03)	0.29(.04)	0.09(.02)
	I	0.2(.02)	0.21(.02)	0.24(.02)	0.53(.04)	0.23(.02)
Stipa viridula	C	0.43(.21)	0.28(.1)	0.96(.37)	0.21(.17)	0.22(.24)
	I	0.57(.2)	0.31(.08)	1.81(.29)	0.66(.19)	0.51(.14)
Stipa viridula (Lodorm)	C	0.59(.09)	0.32(.04)	0.6(.07)	0.74(.05)	0.21(.03)
	I	0.6(.08)	0.39(.04)	0.69(.06)	0.65(.05)	0.34(.02)

Table 18. Least-squares mean and standard error (in brackets) of individual above-ground dry weight (g) at the end of the second growing season (1990) within control and previously irrigated moisture treatments at sites along the topographic gradient (Fig. II-23).

		Site				
Species	Treatment	A	B	C	D	E
Agropyron dasystachyum	C	1.1(.13)	1.0(.08)	1.9(.15)	1.3(.09)	0.58(.05)
	I	1.4(.13)	0.82(.08)	1.0(.15)	1.0(.09)	0.45(.04)
Agropyron trachycaulum	C	2.4(.27)	1.3(.11)	2.0(.31)	3.0(.26)	4.0(.35)
	I	1.7(.27)	1.1(.11)	1.5(.31)	2.1(.26)	1.6(.36)
Festuca hallii	C	0.08(.016)	0.11(.026)	0.26(.2)	0.19(.037)	0.03(.028)
	I	0.11(.014)	0.17(.023)	0.25(.07)	0.17(.022)	0.16(.016)
Stipa comata	C	0.88(.13)	0.23(.13)	1.1(.23)	0.63(.07)	0.23(.04)
	I	0.81(.14)	0.82(.16)	0.78(.26)	0.5(.09)	0.33(.04)
Stipa curtiseta	C	2.2(.2)	1.5(.16)	2.6(.23)	2.3(.3)	0.82(.07)
	I	1.5(.19)	2.3(.16)	2.1(.23)	3.4(.27)	0.48(.06)
Stipa viridula	C	0.96(.54)	1.1(.22)	0.72(.35)	0.08(.1)	0.28(.17)
	I	2.1(.66)	0.41(.29)	0.39(.43)	0.34(.06)	0.38(.23)
Stipa viridula (Lodorm)	C	2.4(.27)	1.3(.14)	5.1(.59)	1.9(.27)	1.3(.15)
	I	2.0(.21)	1.7(.15)	3.6(.49)	2.2(.2)	1.0(.1)

Table 19. Least-squares mean and standard error (in brackets) of the number of tillers per individual at the end of the first growing season (1989) within control and irrigated moisture treatments at sites along the topographic gradient (Fig. II-24).

		Site				
Species	Treatment	A	B	C	D	E
Agropyron	C	4.6(.46)	4.4(.26)	8.4(.7)	9.6(.85)	7.7(.61)
dasystachyum	I	5.7(.48)	6.5(.45)	6.6(.58)	10.4(1.2)	6.7(.48)
Agropyron	C	8.1(.84)	8.5(.61)	6.5(.63)	9.7(.77)	10.3(.84)
trachycaulum	I	7.5(.59)	9.0(.52)	9.9(.67)	14.3(.96)	11.5(.67)
Bromus	C	2.2(.17)	1.7(.12)	3.5(.4)	3.4(.24)	4.7(.45)
inermis	I	2.6(.21)	2.5(.17)	2.4(.24)	2.7(.20)	3.2(.21)
Festuca	C	2.9(.26)	2.9(.28)	2.4(.37)	2.6(.24)	1.3(.1)
hallii	I	4.2(.3)	4.8(.28)	3.6(.32)	5.3(.32)	5.5(.35)
Stipa	C	13.2(2.3)	13.3(2.9)	10.3(1.7)	14.6(1.7)	7.5(.46)
comata	I	16.9(1.7)	17.2(1.7)	18.0(1.9)	28.1(3.5)	15.7(1.5)
Stipa	C	14.0(.97)	12.2(.98)	14.4(1.7)	19.7(1.8)	6.9(.57)
curtiseta	I	22.3(1.4)	21.8(1.7)	25.7(1.2)	35.1(2.0)	24.3(1.5)
Stipa	C	9.5(1.9)	10.5(1.9)	22.3(1.5)	7.0(1.3)	4.3(.88)
viridula	I	13.0(4.6)	10.9(1.7)	25.4(4.1)	15.0(6.7)	13.6(1.7)
Stipa	C	8.9(1.4)	5.7(.48)	9.7(.9)	10.1(.57)	4.7(.53)
viridula (Lodorm)	I	12.3(1.1)	8.1(.53)	10.6(.77)	10.9(.58)	7.8(.46)

Table 20. Least-squares mean and standard error (in brackets) of flowering culms produced per individual plant at the end of the second growing season (1990) in control and previously irrigated (1989) plots at sites along the topographic gradient (Fig. II-25).

		Site				
Species	Treatment	A	B	C	D	E
Agropyron	C	4.1(.49)	3.1(.37)	4.9(.57)	3.7(.41)	1.8(.27)
dasystachyum	I	4.4(.52)	1.9(.36)	2.1(.31)	2.6(.35)	0.27(.09)
Agropyron	C	4.8(.77)	3.0(.35)	4.3(.5)	4.8(.6)	6.4(.67)
trachycaulum	I	3.1(.47)	1.2(.19)	2.8(.29)	3.9(.35)	3.9(.31)
Festuca	C	0	0	0	0	0
hallii	I	0	0	0	0	0
Stipa	C	4.2(.89)	1.2(.36)	1.6(.56)	3.4(.61)	0.95(.23)
comata	I	5.4(1.1)	3.8(1.3)	6.3(1.6)	3.1(.7)	1.7(.32)
Stipa	C	8.0(.85)	5.4(.64)	6.8(.8)	7.8(1.0)	3.1(.34)
curtiseta	I	8.6(.75)	10.6(.89)	9.7(.74)	10.2(.99)	2.3(.25)
Stipa	C	2.3(.98)	0.93(.37)	0.60(.42)	0.31(.24)	0.12(.12)
viridula	I	1.3(.86)	1.7(.46)	1.8(1.0)	0.38(.22)	0.59(.28)
Stipa	C	1.9(.39)	1.5(.22)	4.0(.61)	0.83(.23)	0.46(.15)
viridula (Lodorm)	I	1.6(.27)	1.8(.28)	4.9(.51)	2.4(.27)	0.27(.08)

Appendix 6 - Table 1

A - Species:
- 1 - *Agropyron dasystachyum*
- 2 - *Agropyron trachycaulum*
- 3 - *Bromus inermis*
- 4 - *Festuca hallii*
- 5 - *Stipa comata*
- 6 - *Stipa curtiseta*
- 7 - *Stipa viridula*
- 8 - *Stipa viridula* (Lodorm)

B - Cohort number

C - Site along topographic gradient (A=ridge, E=toe of slope)

D - Moisture treatment:
- 1 - Control
- 2 - Irrigated

E - Plot (replicate)

F - Subplot (duplicate)

G - Count number:
- 1 - June 5, 1989
- 2 - June 13, 1989
- 3 - June 26, 1989
- 4 - July 4, 1989
- 5 - July 18, 1989
- 6 - July 26, 1989
- 7 - August 10, 1989
- 8 - August 19, 1989 (Survivorship)
- 8 - September 3, 1989 (Germination)
- 9 - May 17, 1990
- 9.5 - May 29, 1990
- 10 - July 26, 1990

H - Germination and subsequent survivorship

Table 1.1. Individual germination and survivorship data for *Agropyron dasystachyum* from field experiment in 1989 and 1990.

A	B	C	D	E	F	G	H
1	1	1	1	1	1	1	47
1	1	1	1	1	1	2	47
1	1	1	1	1	1	3	47
1	1	1	1	1	1	4	46
1	1	1	1	1	1	5	46
1	1	1	1	1	1	6	45
1	1	1	1	1	1	7	45
1	1	1	1	1	1	8	44
1	1	1	1	1	1	9	46
1	1	1	1	1	1	10	46
1	1	1	1	1	2	1	51
1	1	1	1	1	2	2	51
1	1	1	1	1	2	3	51
1	1	1	1	1	2	4	51
1	1	1	1	1	2	5	51
1	1	1	1	1	2	6	51
1	1	1	1	1	2	7	51
1	1	1	1	1	2	8	50
1	1	1	1	1	2	9	51
1	1	1	1	1	2	10	51
1	1	1	1	2	1	1	26
1	1	1	1	2	1	2	26
1	1	1	1	2	1	3	26
1	1	1	1	2	1	4	26
1	1	1	1	2	1	5	26
1	1	1	1	2	1	6	25
1	1	1	1	2	1	7	20
1	1	1	1	2	1	8	22
1	1	1	1	2	1	9	22
1	1	1	1	2	1	10	22
1	1	1	1	2	2	1	44
1	1	1	1	2	2	2	44
1	1	1	1	2	2	3	44
1	1	1	1	2	2	4	43
1	1	1	1	2	2	5	42
1	1	1	1	2	2	6	42
1	1	1	1	2	2	7	42
1	1	1	1	2	2	8	41
1	1	1	1	2	2	9	
1	1	1	1	2	2	10	43
1	1	1	1	3	1	1	52
1	1	1	1	3	1	2	52
1	1	1	1	3	1	3	52
1	1	1	1	3	1	4	52
1	1	1	1	3	1	5	51
1	1	1	1	3	1	6	51
1	1	1	1	3	1	7	51
1	1	1	1	3	1	8	51
1	1	1	1	3	1	9	
1	1	1	1	3	1	10	51
1	1	1	1	3	2	1	48
1	1	1	1	3	2	2	48
1	1	1	1	3	2	3	48
1	1	1	1	3	2	4	48
1	1	1	1	3	2	5	48
1	1	1	1	3	2	6	46
1	1	1	1	3	2	7	46
1	1	1	1	3	2	8	45
1	1	1	1	3	2	9	
1	1	1	1	3	2	10	47
1	1	1	2	1	1	1	60
1	1	1	2	1	1	2	60
1	1	1	2	1	1	3	59
1	1	1	2	1	1	4	59
1	1	1	2	1	1	5	59
1	1	1	2	1	1	6	58
1	1	1	2	1	1	7	58
1	1	1	2	1	1	8	58
1	1	1	2	1	1	9	
1	1	1	2	1	1	10	58
1	1	1	2	1	2	1	51
1	1	1	2	1	2	2	51
1	1	1	2	1	2	3	51
1	1	1	2	1	2	4	49
1	1	1	2	1	2	5	49
1	1	1	2	1	2	6	49
1	1	1	2	1	2	7	48
1	1	1	2	1	2	8	48
1	1	1	2	1	2	9	
1	1	1	2	1	2	10	48
1	1	1	2	2	1	1	59
1	1	1	2	2	1	2	59
1	1	1	2	2	1	3	59
1	1	1	2	2	1	4	58
1	1	1	2	2	1	5	58
1	1	1	2	2	1	6	58
1	1	1	2	2	1	7	58
1	1	1	2	2	1	8	58
1	1	1	2	2	1	9	
1	1	1	2	2	1	10	58
1	1	1	2	2	2	1	59
1	1	1	2	2	2	2	59
1	1	1	2	2	2	3	59
1	1	1	2	2	2	4	59
1	1	1	2	2	2	5	59
1	1	1	2	2	2	6	59
1	1	1	2	2	2	7	59
1	1	1	2	2	2	8	58
1	1	1	2	2	2	9	
1	1	1	2	2	2	10	59
1	1	1	2	3	1	1	59
1	1	1	2	3	1	2	59
1	1	1	2	3	1	3	59
1	1	1	2	3	1	4	59
1	1	1	2	3	1	5	59
1	1	1	2	3	1	6	59
1	1	1	2	3	1	7	59
1	1	1	2	3	1	8	57
1	1	1	2	3	1	9	
1	1	1	2	3	1	10	59
1	1	1	2	3	2	1	48
1	1	1	2	3	2	2	48
1	1	1	2	3	2	3	45
1	1	1	2	3	2	4	45
1	1	1	2	3	2	5	45
1	1	1	2	3	2	6	45
1	1	1	2	3	2	7	45
1	1	1	2	3	2	8	45
1	1	1	2	3	2	9	
1	1	1	2	3	2	10	45
1	1	2	1	1	1	1	49
1	1	2	1	1	1	2	49
1	1	2	1	1	1	3	48
1	1	2	1	1	1	4	48
1	1	2	1	1	1	5	48
1	1	2	1	1	1	6	47
1	1	2	1	1	1	7	47
1	1	2	1	1	1	8	44
1	1	2	1	1	1	9	
1	1	2	1	1	1	10	46
1	1	2	1	1	2	1	51
1	1	2	1	1	2	2	51
1	1	2	1	1	2	3	50
1	1	2	1	1	2	4	50
1	1	2	1	1	2	5	50
1	1	2	1	1	2	6	50
1	1	2	1	1	2	7	50
1	1	2	1	1	2	8	50
1	1	2	1	1	2	9	
1	1	2	1	1	2	10	50
1	1	2	1	2	1	1	56
1	1	2	1	2	1	2	56
1	1	2	1	2	1	3	56
1	1	2	1	2	1	4	56
1	1	2	1	2	1	5	56
1	1	2	1	2	1	6	56
1	1	2	1	2	1	7	54
1	1	2	1	2	1	8	50
1	1	2	1	2	1	9	
1	1	2	1	2	1	10	50
1	1	2	1	2	2	1	56
1	1	2	1	2	2	2	56
1	1	2	1	2	2	3	56
1	1	2	1	2	2	4	56
1	1	2	1	2	2	5	56
1	1	2	1	2	2	6	56
1	1	2	1	2	2	7	56
1	1	2	1	2	2	8	56
1	1	2	1	2	2	9	
1	1	2	1	2	2	10	56
1	1	2	1	3	1	1	54
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1	8	5	2	2	2	9	0
1	8	5	2	2	2	10	0
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1	8	5	2	3	1	9	0
1	8	5	2	3	1	10	0
1	8	5	2	3	2	8	0
1	8	5	2	3	2	9	0
1	8	5	2	3	2	10	0

Appendix 6 - Table 1

A - Species:
- 1 - *Agropyron dasystachyum*
- 2 - *Agropyron trachycaulum*
- 3 - *Bromus inermis*
- 4 - *Festuca hallii*
- 5 - *Stipa comata*
- 6 - *Stipa curtiseta*
- 7 - *Stipa viridula*
- 8 - *Stipa viridula* (Lodorm)

B - Cohort number

C - Site along topographic gradient (A=ridge, E=toe of slope)

D - Moisture treatment:
- 1 - Control
- 2 - Irrigated

E - Plot (replicate)

F - Subplot (duplicate)

G - Count number:
- 1 - June 5, 1989
- 2 - June 13, 1989
- 3 - June 26, 1989
- 4 - July 4, 1989
- 5 - July 18, 1989
- 6 - July 26, 1989
- 7 - August 10, 1989
- 8 - August 19, 1989 (Survivorship)
- 8 - September 3, 1989 (Germination)
- 9 - May 17, 1990
- 9.5 - May 29, 1990
- 10 - July 26, 1990

H - Germination and subsequent survivorship

Table 1.2. Individual germination and survivorship data for *Agropyron trachycaulum* from field experiment in 1989 and 1990.

A	B	C	D	E	F	G	H
2	1	1	1	1	1	1	49
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2	1	1	1	1	1	3	49
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2	1	1	1	1	2	5	52
2	1	1	1	1	2	6	51
2	1	1	1	1	2	7	51
2	1	1	1	1	2	8	49
2	1	1	1	1	2	9	48
2	1	1	1	1	2	10	48
2	1	1	1	2	1	1	53
2	1	1	1	2	1	2	53
2	1	1	1	2	1	3	52
2	1	1	1	2	1	4	52
2	1	1	1	2	1	5	52
2	1	1	1	2	1	6	52
2	1	1	1	2	1	7	51
2	1	1	1	2	1	8	50
2	1	1	1	2	1	9	50
2	1	1	1	2	1	10	50
2	1	1	1	2	2	1	50
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2	1	1	1	2	2	7	49
2	1	1	1	2	2	8	48
2	1	1	1	2	2	9	
2	1	1	1	2	2	10	48
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2	1	1	1	3	1	2	41
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2	1	1	1	3	1	6	40
2	1	1	1	3	1	7	40
2	1	1	1	3	1	8	40
2	1	1	1	3	1	9	
2	1	1	1	3	1	10	40
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2	1	1	1	3	2	2	31
2	1	1	1	3	2	3	31
2	1	1	1	3	2	4	31
2	1	1	1	3	2	5	31
2	1	1	1	3	2	6	31
2	1	1	1	3	2	7	31
2	1	1	1	3	2	8	31
2	1	1	1	3	2	9	
2	1	1	1	3	2	10	31
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2	1	1	2	1	1	2	58
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2	1	1	2	1	1	4	57
2	1	1	2	1	1	5	57
2	1	1	2	1	1	6	56
2	1	1	2	1	1	7	56
2	1	1	2	1	1	8	56
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2	1	1	2	1	1	10	56
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2	1	1	2	1	2	7	54
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2	1	1	2	2	1	2	62
2	1	1	2	2	1	3	61
2	1	1	2	2	1	4	61
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2	1	1	2	2	1	6	61
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2	1	2	1	2	2	8	42
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A	B	C	D	E	F	G	H
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2	1	2	2	2	2	8	54
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2	1	3	1	1	2	7	18
2	1	3	1	1	2	8	18
2	1	3	1	1	2	9	
2	1	3	1	1	2	10	18
2	1	3	1	2	1	1	3

A	B	C	D	E	F	G	H
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2	1	3	1	2	1	4	3
2	1	3	1	2	1	5	3
2	1	3	1	2	1	6	3
2	1	3	1	2	1	7	3
2	1	3	1	2	1	8	3
2	1	3	1	2	1	9	3
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2	1	3	1	2	2	2	7
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2	1	3	1	2	2	7	6
2	1	3	1	2	2	8	6
2	1	3	1	2	2	9	
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2	1	3	1	3	1	2	27
2	1	3	1	3	1	3	27
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2	1	3	1	3	1	7	25
2	1	3	1	3	1	8	25
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2	1	3	2	1	2	3	64
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A	B	C	D	E	F	G	H
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2	1	3	2	2	2	7	58
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2	1	3	2	3	1	3	44
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2	1	3	2	3	1	6	43
2	1	3	2	3	1	7	43
2	1	3	2	3	1	8	43
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2	7	2	1	3	2	10	0
2	7	2	2	1	1	7	0
2	7	2	2	1	1	8	0
2	7	2	2	1	1	9	0
2	7	2	2	1	1	10	0
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2	7	2	2	2	2	8	0
2	7	2	2	2	2	9	0
2	7	2	2	2	2	10	0
2	7	2	2	3	1	7	0
2	7	2	2	3	1	8	0
2	7	2	2	3	1	9	0
2	7	2	2	3	1	10	0
2	7	2	2	3	2	7	0
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2	7	3	1	1	2	9	0
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2	7	3	1	2	2	8	0
2	7	3	1	2	2	9	0
2	7	3	1	2	2	10	0
2	7	3	1	3	1	7	0
2	7	3	1	3	1	8	0

A	B	C	D	E	F	G	H
2	7	3	1	3	1	9	0
2	7	3	1	3	1	10	0
2	7	3	1	3	2	7	0
2	7	3	1	3	2	8	0
2	7	3	1	3	2	9	0
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2	7	4	2	2	1	10	0
2	7	4	2	2	2	7	0
2	7	4	2	2	2	8	0
2	7	4	2	2	2	9	0
2	7	4	2	2	2	10	0

A	B	C	D	E	F	G	H
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2	7	4	2	3	1	8	0
2	7	4	2	3	1	9	0
2	7	4	2	3	1	10	0
2	7	4	2	3	2	7	0
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2	7	5	2	3	2	9	0
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2	8	1	1	1	2	8	0
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2	8	1	1	1	2	10	0
2	8	1	1	2	1	8	0
2	8	1	1	2	1	9	0
2	8	1	1	2	1	10	0
2	8	1	1	2	2	8	0

A	B	C	D	E	F	G	H
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2	8	1	1	3	1	9	0
2	8	1	1	3	1	10	0
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2	8	2	2	3	2	10	0
2	8	3	1	1	1	8	0
2	8	3	1	1	1	9	0
2	8	3	1	1	1	10	0
2	8	3	1	1	2	8	0

A	B	C	D	E	F	G	H
2	8	3	1	1	2	9	0
2	8	3	1	1	2	10	0
2	8	3	1	2	1	8	0
2	8	3	1	2	1	9	0
2	8	3	1	2	1	10	0
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2	8	3	2	3	2	10	0
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2	8	4	1	1	1	9	0
2	8	4	1	1	1	10	0
2	8	4	1	1	2	8	0
2	8	4	1	1	2	9	0
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2	8	4	1	3	2	9	0
2	8	4	1	3	2	10	0
2	8	4	2	1	1	8	0
2	8	4	2	1	1	9	0
2	8	4	2	1	1	10	0
2	8	4	2	1	2	8	0
2	8	4	2	1	2	9	0
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2	8	4	2	3	1	10	0
2	8	4	2	3	2	8	0
2	8	4	2	3	2	9	0
2	8	4	2	3	2	10	0
2	8	5	1	1	1	8	0

A	B	C	D	E	F	G	H
2	8	5	1	1	1	9	0
2	8	5	1	1	1	10	0
2	8	5	1	1	2	8	0
2	8	5	1	1	2	9	0
2	8	5	1	1	2	10	0
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2	8	5	2	1	1	8	0
2	8	5	2	1	1	9	0
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2	8	5	2	1	2	9	0
2	8	5	2	1	2	10	0
2	8	5	2	2	1	8	0
2	8	5	2	2	1	9	0
2	8	5	2	2	1	10	0
2	8	5	2	2	2	8	0
2	8	5	2	2	2	9	0
2	8	5	2	2	2	10	0
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2	8	5	2	3	1	9	0
2	8	5	2	3	1	10	0
2	8	5	2	3	2	8	0
2	8	5	2	3	2	9	0
2	8	5	2	3	2	10	0

Appendix 6 - Table 1

A - Species:
- 1 - *Agropyron dasystachyum*
- 2 - *Agropyron trachycaulum*
- 3 - *Bromus inermis*
- 4 - *Festuca hallii*
- 5 - *Stipa comata*
- 6 - *Stipa curtiseta*
- 7 - *Stipa viridula*
- 8 - *Stipa viridula* (Lodorm)

B - Cohort number

C - Site along topographic gradient (A=ridge, E=toe of slope)

D - Moisture treatment:
- 1 - Control
- 2 - Irrigated

E - Plot (replicate)

F - Subplot (duplicate)

G - Count number:
- 1 - June 5, 1989
- 2 - June 13, 1989
- 3 - June 26, 1989
- 4 - July 4, 1989
- 5 - July 18, 1989
- 6 - July 26, 1989
- 7 - August 10, 1989
- 8 - August 19, 1989 (Survivorship)
- 8 - September 3, 1989 (Germination)
- 9 - May 17, 1990
- 9.5 - May 29, 1990
- 10 - July 26, 1990

H - Germination and subsequent survivorship

Table 1.3. Individual germination and survivorship data for *Bromus inermis* from field experiment in 1989 and 1990.

A	B	C	D	E	F	G	H
3	1	1	1	1	1	1	61
3	1	1	1	1	1	2	61
3	1	1	1	1	1	3	61
3	1	1	1	1	1	4	61
3	1	1	1	1	1	5	61
3	1	1	1	1	1	6	61
3	1	1	1	1	1	7	61
3	1	1	1	1	1	8	54
3	1	1	1	1	2	1	66
3	1	1	1	1	2	2	66
3	1	1	1	1	2	3	66
3	1	1	1	1	2	4	66
3	1	1	1	1	2	5	66
3	1	1	1	1	2	6	66
3	1	1	1	1	2	7	66
3	1	1	1	1	2	8	57
3	1	1	1	2	1	1	29
3	1	1	1	2	1	2	29
3	1	1	1	2	1	3	29
3	1	1	1	2	1	4	29
3	1	1	1	2	1	5	29
3	1	1	1	2	1	6	29
3	1	1	1	2	1	7	28
3	1	1	1	2	1	8	28
3	1	1	1	2	2	1	47
3	1	1	1	2	2	2	47
3	1	1	1	2	2	3	47
3	1	1	1	2	2	4	47
3	1	1	1	2	2	5	47
3	1	1	1	2	2	6	47
3	1	1	1	2	2	7	47
3	1	1	1	2	2	8	45
3	1	1	1	3	1	1	33
3	1	1	1	3	1	2	33
3	1	1	1	3	1	3	33
3	1	1	1	3	1	4	32
3	1	1	1	3	1	5	32
3	1	1	1	3	1	6	32
3	1	1	1	3	1	7	31
3	1	1	1	3	1	8	30
3	1	1	1	3	2	1	48
3	1	1	1	3	2	2	48
3	1	1	1	3	2	3	47
3	1	1	1	3	2	4	47
3	1	1	1	3	2	5	47
3	1	1	1	3	2	6	47
3	1	1	1	3	2	7	47
3	1	1	1	3	2	8	46
3	1	1	2	1	1	1	56
3	1	1	2	1	1	2	56
3	1	1	2	1	1	3	56
3	1	1	2	1	1	4	56
3	1	1	2	1	1	5	56
3	1	1	2	1	1	6	56
3	1	1	2	1	1	7	56
3	1	1	2	1	1	8	56
3	1	1	2	1	2	1	59
3	1	1	2	1	2	2	59
3	1	1	2	1	2	3	58
3	1	1	2	1	2	4	58
3	1	1	2	1	2	5	58
3	1	1	2	1	2	6	58
3	1	1	2	1	2	7	58
3	1	1	2	1	2	8	58
3	1	1	2	2	1	1	68
3	1	1	2	2	1	2	68
3	1	1	2	2	1	3	67
3	1	1	2	2	1	4	67
3	1	1	2	2	1	5	67
3	1	1	2	2	1	6	67
3	1	1	2	2	1	7	67
3	1	1	2	2	1	8	67
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3	1	1	2	2	2	2	64
3	1	1	2	2	2	3	64
3	1	1	2	2	2	4	64
3	1	1	2	2	2	5	64
3	1	1	2	2	2	6	64
3	1	1	2	2	2	7	64
3	1	1	2	2	2	8	64
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3	1	1	2	3	1	2	51
3	1	1	2	3	1	3	51
3	1	1	2	3	1	4	51
3	1	1	2	3	1	5	51
3	1	1	2	3	1	6	51
3	1	1	2	3	1	7	51
3	1	1	2	3	1	8	51
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3	1	1	2	3	2	4	57
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3	1	1	2	3	2	6	57
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3	1	2	1	1	1	1	56
3	1	2	1	1	1	2	56
3	1	2	1	1	1	3	56
3	1	2	1	1	1	4	56
3	1	2	1	1	1	5	56
3	1	2	1	1	1	6	56
3	1	2	1	1	1	7	56
3	1	2	1	1	1	8	40
3	1	2	1	1	2	1	60
3	1	2	1	1	2	2	60
3	1	2	1	1	2	3	60
3	1	2	1	1	2	4	60
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3	7	3	1	2	1	7	0
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3	7	3	1	3	2	7	0
3	7	3	1	3	2	8	0
3	7	3	2	1	1	7	0
3	7	3	2	1	1	8	0
3	7	3	2	1	2	7	0

A	B	C	D	E	F	G	H
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3	8	1	1	3	1	8	0
3	8	1	1	3	2	8	0
3	8	1	2	1	1	8	0
3	8	1	2	1	2	8	0
3	8	1	2	2	1	8	0

A	B	C	D	E	F	G	H
3	8	1	2	2	2	8	0
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3	8	1	2	3	2	8	0
3	8	2	1	1	1	8	0
3	8	2	1	1	2	8	0
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3	8	4	2	1	1	8	0
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3	8	4	2	3	2	8	0
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3	8	5	1	1	2	8	0
3	8	5	1	2	1	8	0
3	8	5	1	2	2	8	0
3	8	5	1	3	1	8	0
3	8	5	1	3	2	8	0
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3	8	5	2	1	2	8	0
3	8	5	2	2	1	8	0
3	8	5	2	2	2	8	0
3	8	5	2	3	1	8	0
3	8	5	2	3	2	8	0

Appendix 6 - Table 1

A - Species:
- 1 - *Agropyron dasystachyum*
- 2 - *Agropyron trachycaulum*
- 3 - *Bromus inermis*
- 4 - *Festuca hallii*
- 5 - *Stipa comata*
- 6 - *Stipa curtiseta*
- 7 - *Stipa viridula*
- 8 - *Stipa viridula* (Lodorm)

B - Cohort number

C - Site along topographic gradient (A=ridge, E=toe of slope)

D - Moisture treatment:
- 1 - Control
- 2 - irrigated

E - Plot (replicate)

F - Subplot (duplicate)

G - Count number:
- 1 - June 5, 1989
- 2 - June 13, 1989
- 3 - June 26, 1989
- 4 - July 4, 1989
- 5 - July 18, 1989
- 6 - July 26, 1989
- 7 - August 10, 1989
- 8 - August 19, 1989 (Survivorship)
- 8 - September 3, 1989 (Germination)
- 9 - May 17, 1990
- 9.5 - May 29, 1990
- 10 - July 26, 1990

H - Germination and subsequent survivorship

Table 1.4. Individual germination and survivorship data for *Festuca hallii* from field experiment in 1989 and 1990.

A	B	C	D	E	F	G	H
4	1	1	1	1	1	1	2
4	1	1	1	1	1	2	2
4	1	1	1	1	1	3	2
4	1	1	1	1	1	4	2
4	1	1	1	1	1	5	2
4	1	1	1	1	1	6	2
4	1	1	1	1	1	7	1
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4	1	1	1	1	2	3	2
4	1	1	1	1	2	4	2
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4	1	1	1	1	2	6	2
4	1	1	1	1	2	7	2
4	1	1	1	1	2	8	2
4	1	1	1	1	2	9	2
4	1	1	1	1	2	10	2
4	1	1	1	2	1	1	0
4	1	1	1	2	1	2	0
4	1	1	1	2	1	3	0
4	1	1	1	2	1	4	0
4	1	1	1	2	1	5	0
4	1	1	1	2	1	6	0
4	1	1	1	2	1	7	0
4	1	1	1	2	1	8	0
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4	1	1	1	2	2	2	0
4	1	1	1	2	2	3	0
4	1	1	1	2	2	4	0
4	1	1	1	2	2	5	0
4	1	1	1	2	2	6	0
4	1	1	1	2	2	7	0
4	1	1	1	2	2	8	0
4	1	1	1	2	2	9	0
4	1	1	1	2	2	10	0
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4	1	1	1	3	1	6	0
4	1	1	1	3	1	7	0
4	1	1	1	3	1	8	0
4	1	1	1	3	1	9	0
4	1	1	1	3	1	10	0
4	1	1	1	3	2	1	0
4	1	1	1	3	2	2	0
4	1	1	1	3	2	3	0
4	1	1	1	3	2	4	0
4	1	4	1	3	2	5	0
4	1	1	1	3	2	6	0
4	1	1	1	3	2	7	0
4	1	1	1	3	2	8	0
4	1	1	1	3	2	9	0
4	1	1	1	3	2	10	0
4	1	1	2	1	1	1	13
4	1	1	2	1	1	2	13
4	1	1	2	1	1	3	13
4	1	1	2	1	1	4	13
4	1	1	2	1	1	5	13
4	1	1	2	1	1	6	12
4	1	1	2	1	1	7	12
4	1	1	2	1	1	8	12
4	1	1	2	1	1	9	10
4	1	1	2	1	1	10	9
4	1	1	2	1	2	1	7
4	1	1	2	1	2	2	7
4	1	1	2	1	2	3	7
4	1	1	2	1	2	4	7
4	1	1	2	1	2	5	5
4	1	1	2	1	2	6	5
4	1	1	2	1	2	7	4
4	1	1	2	1	2	8	4
4	1	1	2	1	2	9	4
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4	1	1	2	2	1	7	6
4	1	1	2	2	1	8	6
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4	1	1	2	2	2	2	5
4	1	1	2	2	2	3	5
4	1	1	2	2	2	4	5
4	1	1	2	2	2	5	5
4	1	1	2	2	2	6	5
4	1	1	2	2	2	7	5
4	1	1	2	2	2	8	4
4	1	1	2	2	2	9	4
4	1	1	2	2	2	10	4
4	1	1	2	3	1	1	9
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4	1	1	2	3	1	4	9
4	1	1	2	3	1	5	9
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4	1	1	2	3	1	8	9
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4	1	1	2	3	1	10	6
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4	1	1	2	3	2	2	1
4	1	1	2	3	2	3	1
4	1	1	2	3	2	4	1
4	1	1	2	3	2	5	1
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4	1	1	2	3	2	9	1
4	1	1	2	3	2	10	1
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4	1	2	1	1	1	2	0
4	1	2	1	1	1	3	0
4	1	2	1	1	1	4	0
4	1	2	1	1	1	5	0
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4	1	2	1	1	1	7	0
4	1	2	1	1	1	8	0
4	1	2	1	1	1	9	0
4	1	2	1	1	1	10	0
4	1	2	1	1	2	1	2
4	1	2	1	1	2	2	2
4	1	2	1	1	2	3	2
4	1	2	1	1	2	4	2
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4	1	2	1	1	2	6	2
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4	1	2	1	1	2	9	2
4	1	2	1	1	2	10	2
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4	1	2	1	2	1	2	0
4	1	2	1	2	1	3	0
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4	1	2	1	3	2	3	1
4	1	2	1	3	2	4	1
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4	1	2	1	3	2	8	1
4	1	2	1	3	2	9	1
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4	1	2	2	1	1	3	6
4	1	2	2	1	1	4	5
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4	1	2	2	1	1	7	2
4	1	2	2	1	1	8	2
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4	1	2	2	1	2	2	8
4	1	2	2	1	2	3	8
4	1	2	2	1	2	4	8
4	1	2	2	1	2	5	8

A	B	C	D	E	F	G	H
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4	1	2	2	3	2	9	6
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4	1	3	1	1	1	3	0
4	1	3	1	1	1	4	0
4	1	3	1	1	1	5	0
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4	1	3	1	1	1	8	0
4	1	3	1	1	1	9	0
4	1	3	1	1	1	10	0
4	1	3	1	1	2	1	0
4	1	3	1	1	2	2	0
4	1	3	1	1	2	3	0
4	1	3	1	1	2	4	0
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4	1	3	1	1	2	6	0
4	1	3	1	1	2	7	0
4	1	3	1	1	2	8	0
4	1	3	1	1	2	9	0
4	1	3	1	1	2	10	0
4	1	3	1	2	1	1	0

A	B	C	D	E	F	G	H
4	1	3	1	2	1	2	0
4	1	3	1	2	1	3	0
4	1	3	1	2	1	4	0
4	1	3	1	2	1	5	0
4	1	3	1	2	1	6	0
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4	1	3	1	2	1	9	0
4	1	3	1	2	1	10	0
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4	1	3	1	2	2	2	0
4	1	3	1	2	2	3	0
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4	1	3	1	2	2	6	0
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4	1	3	1	3	2	7	0
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4	7	1	1	3	1	9	0
4	7	1	1	3	1	10	0
4	7	1	1	3	2	7	0
4	7	1	1	3	2	8	0
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4	7	1	2	1	1	7	0
4	7	1	2	1	1	8	0
4	7	1	2	1	1	9	0
4	7	1	2	1	1	10	0
4	7	1	2	1	2	7	0
4	7	1	2	1	2	8	0
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4	7	1	2	2	2	10	0
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4	7	1	2	3	1	8	0
4	7	1	2	3	1	9	0
4	7	1	2	3	1	10	0
4	7	1	2	3	2	7	0
4	7	1	2	3	2	8	0
4	7	1	2	3	2	9	0
4	7	1	2	3	2	10	0

A	B	C	D	E	F	G	H
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4	7	2	1	1	1	8	0
4	7	2	1	1	1	9	0
4	7	2	1	1	1	10	0
4	7	2	1	1	2	7	0
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4	7	2	1	2	1	9	0
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4	7	2	2	2	2	9	0
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4	7	3	1	2	2	8	0
4	7	3	1	2	2	9	0
4	7	3	1	2	2	10	0
4	7	3	1	3	1	7	0
4	7	3	1	3	1	8	0

A	B	C	D	E	F	G	H
4	7	3	1	3	1	9	0
4	7	3	1	3	1	10	0
4	7	3	1	3	2	7	0
4	7	3	1	3	2	8	0
4	7	3	1	3	2	9	0
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4	7	4	2	2	1	10	0
4	7	4	2	2	2	7	0
4	7	4	2	2	2	8	0
4	7	4	2	2	2	9	0
4	7	4	2	2	2	10	0

A	B	C	D	E	F	G	H
4	7	4	2	3	1	7	0
4	7	4	2	3	1	8	0
4	7	4	2	3	1	9	0
4	7	4	2	3	1	10	0
4	7	4	2	3	2	7	0
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4	8	1	1	1	2	10	0
4	8	1	1	2	1	8	0
4	8	1	1	2	1	9	0
4	8	1	1	2	1	10	0
4	8	1	1	2	2	8	0

A	B	C	D	E	F	G	H
4	8	1	1	2	2	9	0
4	8	1	1	2	2	10	0
4	8	1	1	3	1	8	0
4	8	1	1	3	1	9	0
4	8	1	1	3	1	10	0
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4	8	2	2	3	2	10	0
4	8	3	1	1	1	8	0
4	8	3	1	1	1	9	0
4	8	3	1	1	1	10	0
4	8	3	1	1	2	8	0

A	B	C	D	E	F	G	H
4	8	3	1	1	2	9	0
4	8	3	1	1	2	10	0
4	8	3	1	2	1	8	0
4	8	3	1	2	1	9	0
4	8	3	1	2	1	10	0
4	8	3	1	2	2	8	0
4	8	3	1	2	2	9	0
4	8	3	1	2	2	10	0
4	8	3	1	3	1	8	0
4	8	3	1	3	1	9	0
4	8	3	1	3	1	10	0
4	8	3	1	3	2	8	0
4	8	3	1	3	2	9	0
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4	8	3	2	1	2	9	0
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4	8	3	2	2	2	10	0
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4	8	3	2	3	2	9	0
4	8	3	2	3	2	10	0
4	8	4	1	1	1	8	0
4	8	4	1	1	1	9	0
4	8	4	1	1	1	10	0
4	8	4	1	1	2	8	0
4	8	4	1	1	2	9	0
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4	8	4	1	3	1	9	0
4	8	4	1	3	1	10	0
4	8	4	2	1	1	8	0
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4	8	4	2	1	2	9	0
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4	8	4	2	2	1	9	0
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4	8	4	2	3	1	10	0
4	8	4	2	3	2	8	0
4	8	4	2	3	2	9	0
4	8	4	2	3	2	10	0
4	8	5	1	1	1	8	0

A	B	C	D	E	F	G	H
4	8	5	1	1	1	9	0
4	8	5	1	1	1	10	0
4	8	5	1	1	2	8	0
4	8	5	1	1	2	9	0
4	8	5	1	1	2	10	0
4	8	5	1	2	1	8	0
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4	8	5	1	2	2	8	0
4	8	5	1	2	2	9	0
4	8	5	1	2	2	10	0
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4	8	5	2	1	1	8	0
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4	8	5	2	3	1	9	0
4	8	5	2	3	1	10	0
4	8	5	2	3	2	8	0
4	8	5	2	3	2	9	0
4	8	5	2	3	2	10	0

Appendix 6 - Table 1

A - Species:
- 1 - *Agropyron dasystachyum*
- 2 - *Agropyron trachycaulum*
- 3 - *Bromus inermis*
- 4 - *Festuca hallii*
- 5 - *Stipa comata*
- 6 - *Stipa curtiseta*
- 7 - *Stipa viridula*
- 8 - *Stipa viridula* (Lodorm)

B - Cohort number

C - Site along topographic gradient (A=ridge, E=toe of slope)

D - Moisture treatment:
- 1 - Control
- 2 - Irrigated

E - Plot (replicate)

F - Subplot (duplicate)

G - Count number:
- 1 - June 5, 1989
- 2 - June 13, 1989
- 3 - June 26, 1989
- 4 - July 4, 1989
- 5 - July 18, 1989
- 6 - July 26, 1989
- 7 - August 10, 1989
- 8 - August 19, 1989 (Survivorship)
- 8 - September 3, 1989 (Germination)
- 9 - May 17, 1990
- 9.5 - May 29, 1990
- 10 - July 26, 1990

H - Germination and subsequent survivorship

Table 1.5. Individual germination and survivorship data for *Stipa comata* from field experiment in 1989 and 1990.

A	B	C	D	E	F	G	H
5	1.0	1	1	1	1	1.0	3
5	1.0	1	1	1	1	2.0	3
5	1.0	1	1	1	1	3.0	3
5	1.0	1	1	1	1	4.0	3
5	1.0	1	1	1	1	5.0	3
5	1.0	1	1	1	1	6.0	3
5	1.0	1	1	1	1	7.0	3
5	1.0	1	1	1	1	8.0	3
5	1.0	1	1	1	1	9.0	3
5	1.0	1	1	1	1	10	3
5	1.0	1	1	1	2	1.0	1
5	1.0	1	1	1	2	2.0	1
5	1.0	1	1	1	2	3.0	1
5	1.0	1	1	1	2	4.0	1
5	1.0	1	1	1	2	5.0	1
5	1.0	1	1	1	2	6.0	1
5	1.0	1	1	1	2	7.0	1
5	1.0	1	1	1	2	8.0	1
5	1.0	1	1	1	2	9.0	1
5	1.0	1	1	1	2	10	1
5	1.0	1	1	2	1	1.0	2
5	1.0	1	1	2	1	2.0	2
5	1.0	1	1	2	1	3.0	2
5	1.0	1	1	2	1	4.0	2
5	1.0	1	1	2	1	5.0	2
5	1.0	1	1	2	1	6.0	2
5	1.0	1	1	2	1	7.0	1
5	1.0	1	1	2	1	8.0	1
5	1.0	1	1	2	1	9.0	1
5	1.0	1	1	2	1	10	1
5	1.0	1	1	2	2	1.0	4
5	1.0	1	1	2	2	2.0	4
5	1.0	1	1	2	2	3.0	4
5	1.0	1	1	2	2	4.0	4
5	1.0	1	1	2	2	5.0	4
5	1.0	1	1	2	2	6.0	4
5	1.0	1	1	2	2	7.0	4
5	1.0	1	1	2	2	8.0	4
5	1.0	1	1	2	2	9.0	3
5	1.0	1	1	2	2	10	3
5	1.0	1	1	3	1	1.0	3
5	1.0	1	1	3	1	2.0	3
5	1.0	1	1	3	1	3.0	3
5	1.0	1	1	3	1	4.0	3
5	1.0	1	1	3	1	5.0	3
5	1.0	1	1	3	1	6.0	3
5	1.0	1	1	3	1	7.0	3
5	1.0	1	1	3	1	8.0	3
5	1.0	1	1	3	1	9.0	3
5	1.0	1	1	3	1	10	3
5	1.0	1	1	3	2	1.0	1
5	1.0	1	1	3	2	2.0	1
5	1.0	1	1	3	2	3.0	1
5	1.0	1	1	3	2	4.0	1
5	1.0	1	1	3	2	5.0	1
5	1.0	1	1	3	2	6.0	1
5	1.0	1	1	3	2	7.0	1
5	1.0	1	1	3	2	8.0	1
5	1.0	1	1	3	2	9.0	1
5	1.0	1	1	3	2	10	1
5	1.0	1	2	1	1	1.0	8
5	1.0	1	2	1	1	2.0	8
5	1.0	1	2	1	1	3.0	8
5	1.0	1	2	1	1	4.0	8
5	1.0	1	2	1	1	5.0	7
5	1.0	1	2	1	1	6.0	7
5	1.0	1	2	1	1	7.0	7
5	1.0	1	2	1	1	8.0	7
5	1.0	1	2	1	1	9.0	7
5	1.0	1	2	1	1	10	7
5	1.0	1	2	1	2	1.0	2
5	1.0	1	2	1	2	2.0	2
5	1.0	1	2	1	2	3.0	2
5	1.0	1	2	1	2	4.0	2
5	1.0	1	2	1	2	5.0	1
5	1.0	1	2	1	2	6.0	1
5	1.0	1	2	1	2	7.0	1
5	1.0	1	2	1	2	8.0	1
5	1.0	1	2	1	2	9.0	1
5	1.0	1	2	1	2	10	1
5	1.0	1	2	2	1	1.0	6
5	1.0	1	2	2	1	2.0	6
5	1.0	1	2	2	1	3.0	6
5	1.0	1	2	2	1	4.0	6
5	1.0	1	2	2	1	5.0	6
5	1.0	1	2	2	1	6.0	6
5	1.0	1	2	2	1	7.0	6
5	1.0	1	2	2	1	8.0	6
5	1.0	1	2	2	1	9.0	6
5	1.0	1	2	2	1	10	6
5	1.0	1	2	2	2	1.0	5
5	1.0	1	2	2	2	2.0	5
5	1.0	1	2	2	2	3.0	5
5	1.0	1	2	2	2	4.0	5
5	1.0	1	2	2	2	5.0	5
5	1.0	1	2	2	2	6.0	5
5	1.0	1	2	2	2	7.0	5
5	1.0	1	2	2	2	8.0	5
5	1.0	1	2	2	2	9.0	5
5	1.0	1	2	2	2	10	5
5	1.0	1	2	3	1	1.0	2
5	1.0	1	2	3	1	2.0	2
5	1.0	1	2	3	1	3.0	2
5	1.0	1	2	3	1	4.0	2
5	1.0	1	2	3	1	5.0	2
5	1.0	1	2	3	1	6.0	2
5	1.0	1	2	3	1	7.0	2
5	1.0	1	2	3	1	8.0	2
5	1.0	1	2	3	1	9.0	2
5	1.0	1	2	3	1	10	2
5	1.0	1	2	3	2	1.0	4
5	1.0	1	2	3	2	2.0	4
5	1.0	1	2	3	2	3.0	4
5	1.0	1	2	3	2	4.0	4
5	1.0	1	2	3	2	5.0	4
5	1.0	1	2	3	2	6.0	4
5	1.0	1	2	3	2	7.0	4
5	1.0	1	2	3	2	8.0	4
5	1.0	1	2	3	2	9.0	4
5	1.0	1	2	3	2	10	1
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5	1.0	2	1	1	1	3.0	1
5	1.0	2	1	1	1	4.0	1
5	1.0	2	1	1	1	5.0	1
5	1.0	2	1	1	1	6.0	1
5	1.0	2	1	1	1	7.0	1
5	1.0	2	1	1	1	8.0	1
5	1.0	2	1	1	1	9.0	1
5	1.0	2	1	1	1	10	1
5	1.0	2	1	1	2	1.0	2
5	1.0	2	1	1	2	2.0	2
5	1.0	2	1	1	2	3.0	2
5	1.0	2	1	1	2	4.0	2
5	1.0	2	1	1	2	5.0	2
5	1.0	2	1	1	2	6.0	2
5	1.0	2	1	1	2	7.0	2
5	1.0	2	1	1	2	8.0	2
5	1.0	2	1	1	2	9.0	2
5	1.0	2	1	1	2	10	2
5	1.0	2	1	2	1	1.0	3
5	1.0	2	1	2	1	2.0	3
5	1.0	2	1	2	1	3.0	3
5	1.0	2	1	2	1	4.0	3
5	1.0	2	1	2	1	5.0	3
5	1.0	2	1	2	1	6.0	3
5	1.0	2	1	2	1	7.0	3
5	1.0	2	1	2	1	8.0	3
5	1.0	2	1	2	1	9.0	3
5	1.0	2	1	2	1	10	3
5	1.0	2	1	2	2	1.0	6
5	1.0	2	1	2	2	2.0	5
5	1.0	2	1	2	2	3.0	5
5	1.0	2	1	2	2	4.0	5
5	1.0	2	1	2	2	5.0	5
5	1.0	2	1	2	2	6.0	5
5	1.0	2	1	2	2	7.0	5
5	1.0	2	1	2	2	8.0	5
5	1.0	2	1	2	2	9.0	5
5	1.0	2	1	2	2	10	5
5	1.0	2	1	3	1	1.0	2
5	1.0	2	1	3	1	2.0	2
5	1.0	2	1	3	1	3.0	2
5	1.0	2	1	3	1	4.0	2
5	1.0	2	1	3	1	5.0	2
5	1.0	2	1	3	1	6.0	2
5	1.0	2	1	3	1	7.0	2
5	1.0	2	1	3	1	8.0	2
5	1.0	2	1	3	1	9.0	2
5	1.0	2	1	3	1	10	2
5	1.0	2	1	3	2	1.0	1
5	1.0	2	1	3	2	2.0	1
5	1.0	2	1	3	2	3.0	1
5	1.0	2	1	3	2	4.0	1
5	1.0	2	1	3	2	5.0	1
5	1.0	2	1	3	2	6.0	1
5	1.0	2	1	3	2	7.0	1
5	1.0	2	1	3	2	8.0	1
5	1.0	2	1	3	2	9.0	1
5	1.0	2	1	3	2	10	1
5	1.0	2	2	1	1	1.0	4
5	1.0	2	2	1	1	2.0	4
5	1.0	2	2	1	1	3.0	4
5	1.0	2	2	1	1	4.0	3
5	1.0	2	2	1	1	5.0	3
5	1.0	2	2	1	1	6.0	3
5	1.0	2	2	1	1	7.0	3
5	1.0	2	2	1	1	8.0	3
5	1.0	2	2	1	1	9.0	3
5	1.0	2	2	1	1	10	3
5	1.0	2	2	1	2	1.0	8
5	1.0	2	2	1	2	2.0	8
5	1.0	2	2	1	2	3.0	8
5	1.0	2	2	1	2	4.0	8
5	1.0	2	2	1	2	5.0	8

A	B	C	D	E	F	G	H
5	1.0	2	2	1	2	6.0	8
5	1.0	2	2	1	2	7.0	8
5	1.0	2	2	1	2	8.0	8
5	1.0	2	2	1	2	9.0	.
5	1.0	2	2	1	2	10	8
5	1.0	2	2	2	1	1.0	3
5	1.0	2	2	2	1	2.0	3
5	1.0	2	2	2	1	3.0	3
5	1.0	2	2	2	1	4.0	3
5	1.0	2	2	2	1	5.0	3
5	1.0	2	2	2	1	6.0	3
5	1.0	2	2	2	1	7.0	3
5	1.0	2	2	2	1	8.0	3
5	1.0	2	2	2	1	9.0	3
5	1.0	2	2	2	1	10	3
5	1.0	2	2	2	2	1.0	1
5	1.0	2	2	2	2	2.0	1
5	1.0	2	2	2	2	3.0	1
5	1.0	2	2	2	2	4.0	1
5	1.0	2	2	2	2	5.0	1
5	1.0	2	2	2	2	6.0	1
5	1.0	2	2	2	2	7.0	1
5	1.0	2	2	2	2	8.0	1
5	1.0	2	2	2	2	9.0	1
5	1.0	2	2	2	2	10	1
5	1.0	2	2	3	1	1.0	3
5	1.0	2	2	3	1	2.0	3
5	1.0	2	2	3	1	3.0	3
5	1.0	2	2	3	1	4.0	3
5	1.0	2	2	3	1	5.0	3
5	1.0	2	2	3	1	6.0	3
5	1.0	2	2	3	1	7.0	3
5	1.0	2	2	3	1	8.0	3
5	1.0	2	2	3	1	9.0	3
5	1.0	2	2	3	1	10	3
5	1.0	2	2	3	2	1.0	1
5	1.0	2	2	3	2	2.0	1
5	1.0	2	2	3	2	3.0	1
5	1.0	2	2	3	2	4.0	1
5	1.0	2	2	3	2	5.0	1
5	1.0	2	2	3	2	6.0	1
5	1.0	2	2	3	2	7.0	1
5	1.0	2	2	3	2	8.0	1
5	1.0	2	2	3	2	9.0	1
5	1.0	2	2	3	2	10	1
5	1.0	3	1	1	1	1.0	0
5	1.0	3	1	1	1	2.0	0
5	1.0	3	1	1	1	3.0	0
5	1.0	3	1	1	1	4.0	0
5	1.0	3	1	1	1	5.0	0
5	1.0	3	1	1	1	6.0	0
5	1.0	3	1	1	1	7.0	0
5	1.0	3	1	1	1	8.0	0
5	1.0	3	1	1	1	9.0	0
5	1.0	3	1	1	1	10	0
5	1.0	3	1	1	2	1.0	0
5	1.0	3	1	1	2	2.0	0
5	1.0	3	1	1	2	3.0	0
5	1.0	3	1	1	2	4.0	0
5	1.0	3	1	1	2	5.0	0
5	1.0	3	1	1	2	6.0	0
5	1.0	3	1	1	2	7.0	0
5	1.0	3	1	1	2	8.0	0
5	1.0	3	1	1	2	9.0	0
5	1.0	3	1	1	2	10	0
5	1.0	3	1	2	1	1.0	1

A	B	C	D	E	F	G	H
5	1.0	3	1	2	1	2.0	1
5	1.0	3	1	2	1	3.0	1
5	1.0	3	1	2	1	4.0	1
5	1.0	3	1	2	1	5.0	1
5	1.0	3	1	2	1	6.0	1
5	1.0	3	1	2	1	7.0	1
5	1.0	3	1	2	1	8.0	1
5	1.0	3	1	2	1	9.0	1
5	1.0	3	1	2	1	10	1
5	1.0	3	1	2	2	1.0	0
5	1.0	3	1	2	2	2.0	0
5	1.0	3	1	2	2	3.0	0
5	1.0	3	1	2	2	4.0	0
5	1.0	3	1	2	2	5.0	0
5	1.0	3	1	2	2	6.0	0
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5	1.0	3	1	2	2	8.0	0
5	1.0	3	1	2	2	9.0	0
5	1.0	3	1	2	2	10	0
5	1.0	3	1	3	1	1.0	1
5	1.0	3	1	3	1	2.0	1
5	1.0	3	1	3	1	3.0	1
5	1.0	3	1	3	1	4.0	1
5	1.0	3	1	3	1	5.0	1
5	1.0	3	1	3	1	6.0	1
5	1.0	3	1	3	1	7.0	1
5	1.0	3	1	3	1	8.0	1
5	1.0	3	1	3	1	9.0	1
5	1.0	3	1	3	1	10	1
5	1.0	3	1	3	2	1.0	2
5	1.0	3	1	3	2	2.0	2
5	1.0	3	1	3	2	3.0	2
5	1.0	3	1	3	2	4.0	2
5	1.0	3	1	3	2	5.0	2
5	1.0	3	1	3	2	6.0	2
5	1.0	3	1	3	2	7.0	2
5	1.0	3	1	3	2	8.0	2
5	1.0	3	1	3	2	9.0	2
5	1.0	3	1	3	2	10	2
5	1.0	3	2	1	1	1.0	2
5	1.0	3	2	1	1	2.0	2
5	1.0	3	2	1	1	3.0	2
5	1.0	3	2	1	1	4.0	2
5	1.0	3	2	1	1	5.0	2
5	1.0	3	2	1	1	6.0	2
5	1.0	3	2	1	1	7.0	2
5	1.0	3	2	1	1	8.0	2
5	1.0	3	2	1	1	9.0	2
5	1.0	3	2	1	1	10	2
5	1.0	3	2	1	2	1.0	2
5	1.0	3	2	1	2	2.0	2
5	1.0	3	2	1	2	3.0	2
5	1.0	3	2	1	2	4.0	2
5	1.0	3	2	1	2	5.0	2
5	1.0	3	2	1	2	6.0	2
5	1.0	3	2	1	2	7.0	2
5	1.0	3	2	1	2	8.0	2
5	1.0	3	2	1	2	9.0	2
5	1.0	3	2	1	2	10	2
5	1.0	3	2	2	1	1.0	3
5	1.0	3	2	2	1	2.0	3
5	1.0	3	2	2	1	3.0	3
5	1.0	3	2	2	1	4.0	3
5	1.0	3	2	2	1	5.0	3
5	1.0	3	2	2	1	6.0	3
5	1.0	3	2	2	1	7.0	3

A	B	C	D	E	F	G	H
5	1.0	3	2	2	1	8.0	3
5	1.0	3	2	2	1	9.0	3
5	1.0	3	2	2	1	10	3
5	1.0	3	2	2	2	1.0	1
5	1.0	3	2	2	2	2.0	1
5	1.0	3	2	2	2	3.0	1
5	1.0	3	2	2	2	4.0	1
5	1.0	3	2	2	2	5.0	1
5	1.0	3	2	2	2	6.0	1
5	1.0	3	2	2	2	7.0	1
5	1.0	3	2	2	2	8.0	1
5	1.0	3	2	2	2	9.0	1
5	1.0	3	2	2	2	10	1
5	1.0	3	2	3	1	1.0	3
5	1.0	3	2	3	1	2.0	3
5	1.0	3	2	3	1	3.0	3
5	1.0	3	2	3	1	4.0	3
5	1.0	3	2	3	1	5.0	3
5	1.0	3	2	3	1	6.0	3
5	1.0	3	2	3	1	7.0	3
5	1.0	3	2	3	1	8.0	3
5	1.0	3	2	3	1	9.0	3
5	1.0	3	2	3	1	10	3
5	1.0	3	2	3	2	1.0	2
5	1.0	3	2	3	2	2.0	2
5	1.0	3	2	3	2	3.0	2
5	1.0	3	2	3	2	4.0	2
5	1.0	3	2	3	2	5.0	2
5	1.0	3	2	3	2	6.0	2
5	1.0	3	2	3	2	7.0	2
5	1.0	3	2	3	2	8.0	2
5	1.0	3	2	3	2	9.0	2
5	1.0	3	2	3	2	10	2
5	1.0	4	1	1	1	1.0	0
5	1.0	4	1	1	1	2.0	0
5	1.0	4	1	1	1	3.0	0
5	1.0	4	1	1	1	4.0	0
5	1.0	4	1	1	1	5.0	0
5	1.0	4	1	1	1	6.0	0
5	1.0	4	1	1	1	7.0	0
5	1.0	4	1	1	1	8.0	0
5	1.0	4	1	1	1	9.0	0
5	1.0	4	1	1	1	10	0
5	1.0	4	1	1	2	1.0	1
5	1.0	4	1	1	2	2.0	1
5	1.0	4	1	1	2	3.0	1
5	1.0	4	1	1	2	4.0	1
5	1.0	4	1	1	2	5.0	1
5	1.0	4	1	1	2	6.0	1
5	1.0	4	1	1	2	7.0	1
5	1.0	4	1	1	2	8.0	1
5	1.0	4	1	1	2	9.0	1
5	1.0	4	1	1	2	10	1
5	1.0	4	1	2	1	1.0	0
5	1.0	4	1	2	1	2.0	0
5	1.0	4	1	2	1	3.0	0
5	1.0	4	1	2	1	4.0	0
5	1.0	4	1	2	1	5.0	0
5	1.0	4	1	2	1	6.0	0
5	1.0	4	1	2	1	7.0	0
5	1.0	4	1	2	1	8.0	0
5	1.0	4	1	2	1	9.0	0
5	1.0	4	1	2	1	10	0
5	1.0	4	1	2	2	1.0	0
5	1.0	4	1	2	2	2.0	0
5	1.0	4	1	2	2	3.0	0

A	B	C	D	E	F	G	H
5	1.0	4	1	2	2	4.0	0
5	1.0	4	1	2	2	5.0	0
5	1.0	4	1	2	2	6.0	0
5	1.0	4	1	2	2	7.0	0
5	1.0	4	1	2	2	8.0	0
5	1.0	4	1	2	2	9.0	0
5	1.0	4	1	2	2	10	0
5	1.0	4	1	3	1	1.0	1
5	1.0	4	1	3	1	2.0	1
5	1.0	4	1	3	1	3.0	1
5	1.0	4	1	3	1	4.0	1
5	1.0	4	1	3	1	5.0	1
5	1.0	4	1	3	1	6.0	1
5	1.0	4	1	3	1	7.0	1
5	1.0	4	1	3	1	8.0	1
5	1.0	4	1	3	1	9.0	.
5	1.0	4	1	3	1	10	1
5	1.0	4	1	3	2	1.0	2
5	1.0	4	1	3	2	2.0	2
5	1.0	4	1	3	2	3.0	2
5	1.0	4	1	3	2	4.0	2
5	1.0	4	1	3	2	5.0	2
5	1.0	4	1	3	2	6.0	2
5	1.0	4	1	3	2	7.0	2
5	1.0	4	1	3	2	8.0	2
5	1.0	4	1	3	2	9.0	.
5	1.0	4	1	3	2	10	2
5	1.0	4	2	1	1	1.0	3
5	1.0	4	2	1	1	2.0	3
5	1.0	4	2	1	1	3.0	3
5	1.0	4	2	1	1	4.0	3
5	1.0	4	2	1	1	5.0	3
5	1.0	4	2	1	1	6.0	3
5	1.0	4	2	1	1	7.0	3
5	1.0	4	2	1	1	8.0	3
5	1.0	4	2	1	1	9.0	.
5	1.0	4	2	1	1	10	3
5	1.0	4	2	1	2	1.0	5
5	1.0	4	2	1	2	2.0	5
5	1.0	4	2	1	2	3.0	5
5	1.0	4	2	1	2	4.0	5
5	1.0	4	2	1	2	5.0	5
5	1.0	4	2	1	2	6.0	5
5	1.0	4	2	1	2	7.0	5
5	1.0	4	2	1	2	8.0	5
5	1.0	4	2	1	2	9.0	5
5	1.0	4	2	1	2	10	5
5	1.0	4	2	2	1	1.0	1
5	1.0	4	2	2	1	2.0	1
5	1.0	4	2	2	1	3.0	1
5	1.0	4	2	2	1	4.0	1
5	1.0	4	2	2	1	5.0	1
5	1.0	4	2	2	1	6.0	1
5	1.0	4	2	2	1	7.0	1
5	1.0	4	2	2	1	8.0	1
5	1.0	4	2	2	1	9.0	.
5	1.0	4	2	2	1	10	1
5	1.0	4	2	2	2	1.0	1
5	1.0	4	2	2	2	2.0	1
5	1.0	4	2	2	2	3.0	1
5	1.0	4	2	2	2	4.0	0
5	1.0	4	2	2	2	5.0	0
5	1.0	4	2	2	2	6.0	0
5	1.0	4	2	2	2	7.0	0
5	1.0	4	2	2	2	8.0	0
5	1.0	4	2	2	2	9.0	0

A	B	C	D	E	F	G	H
5	1.0	4	2	2	2	10	0
5	1.0	4	2	3	1	1.0	2
5	1.0	4	2	3	1	2.0	2
5	1.0	4	2	3	1	3.0	2
5	1.0	4	2	3	1	4.0	2
5	1.0	4	2	3	1	5.0	2
5	1.0	4	2	3	1	6.0	2
5	1.0	4	2	3	1	7.0	2
5	1.0	4	2	3	1	8.0	2
5	1.0	4	2	3	1	9.0	.
5	1.0	4	2	3	1	10	2
5	1.0	4	2	3	2	1.0	1
5	1.0	4	2	3	2	2.0	1
5	1.0	4	2	3	2	3.0	1
5	1.0	4	2	3	2	4.0	1
5	1.0	4	2	3	2	5.0	1
5	1.0	4	2	3	2	6.0	1
5	1.0	4	2	3	2	7.0	1
5	1.0	4	2	3	2	8.0	1
5	1.0	4	2	3	2	9.0	.
5	1.0	4	2	3	2	10	1
5	1.0	5	1	1	1	1.0	4
5	1.0	5	1	1	1	2.0	4
5	1.0	5	1	1	1	3.0	4
5	1.0	5	1	1	1	4.0	4
5	1.0	5	1	1	1	5.0	4
5	1.0	5	1	1	1	6.0	4
5	1.0	5	1	1	1	7.0	4
5	1.0	5	1	1	1	8.0	4
5	1.0	5	1	1	1	9.0	.
5	1.0	5	1	1	1	10	4
5	1.0	5	1	1	2	1.0	1
5	1.0	5	1	1	2	2.0	1
5	1.0	5	1	1	2	3.0	1
5	1.0	5	1	1	2	4.0	1
5	1.0	5	1	1	2	5.0	1
5	1.0	5	1	1	2	6.0	1
5	1.0	5	1	1	2	7.0	1
5	1.0	5	1	1	2	8.0	1
5	1.0	5	1	1	2	9.0	.
5	1.0	5	1	1	2	10	1
5	1.0	5	1	2	1	1.0	2
5	1.0	5	1	2	1	2.0	2
5	1.0	5	1	2	1	3.0	2
5	1.0	5	1	2	1	4.0	2
5	1.0	5	1	2	1	5.0	2
5	1.0	5	1	2	1	6.0	2
5	1.0	5	1	2	1	7.0	2
5	1.0	5	1	2	1	8.0	2
5	1.0	5	1	2	1	9.0	.
5	1.0	5	1	2	1	10	2
5	1.0	5	1	2	2	1.0	1
5	1.0	5	1	2	2	2.0	1
5	1.0	5	1	2	2	3.0	1
5	1.0	5	1	2	2	4.0	1
5	1.0	5	1	2	2	5.0	1
5	1.0	5	1	2	2	6.0	1
5	1.0	5	1	2	2	7.0	1
5	1.0	5	1	2	2	8.0	0
5	1.0	5	1	2	2	9.0	.
5	1.0	5	1	2	2	10	1
5	1.0	5	1	3	1	1.0	1
5	1.0	5	1	3	1	2.0	1
5	1.0	5	1	3	1	3.0	0
5	1.0	5	1	3	1	4.0	0
5	1.0	5	1	3	1	5.0	0

A	B	C	D	E	F	G	H
5	1.0	5	1	3	1	6.0	0
5	1.0	5	1	3	1	7.0	0
5	1.0	5	1	3	1	8.0	0
5	1.0	5	1	3	1	9.0	0
5	1.0	5	1	3	1	10	0
5	1.0	5	1	3	2	1.0	0
5	1.0	5	1	3	2	2.0	0
5	1.0	5	1	3	2	3.0	0
5	1.0	5	1	3	2	4.0	0
5	1.0	5	1	3	2	5.0	0
5	1.0	5	1	3	2	6.0	0
5	1.0	5	1	3	2	7.0	0
5	1.0	5	1	3	2	8.0	0
5	1.0	5	1	3	2	9.0	0
5	1.0	5	1	3	2	10	0
5	1.0	5	2	1	1	1.0	2
5	1.0	5	2	1	1	2.0	2
5	1.0	5	2	1	1	3.0	2
5	1.0	5	2	1	1	4.0	2
5	1.0	5	2	1	1	5.0	2
5	1.0	5	2	1	1	6.0	2
5	1.0	5	2	1	1	7.0	2
5	1.0	5	2	1	1	8.0	2
5	1.0	5	2	1	1	9.0	.
5	1.0	5	2	1	1	10	2
5	1.0	5	2	1	2	1.0	0
5	1.0	5	2	1	2	2.0	0
5	1.0	5	2	1	2	3.0	0
5	1.0	5	2	1	2	4.0	0
5	1.0	5	2	1	2	5.0	0
5	1.0	5	2	1	2	6.0	0
5	1.0	5	2	1	2	7.0	0
5	1.0	5	2	1	2	8.0	0
5	1.0	5	2	1	2	9.0	0
5	1.0	5	2	1	2	10	0
5	1.0	5	2	2	1	1.0	4
5	1.0	5	2	2	1	2.0	4
5	1.0	5	2	2	1	3.0	4
5	1.0	5	2	2	1	4.0	4
5	1.0	5	2	2	1	5.0	4
5	1.0	5	2	2	1	6.0	4
5	1.0	5	2	2	1	7.0	4
5	1.0	5	2	2	1	8.0	4
5	1.0	5	2	2	1	9.0	.
5	1.0	5	2	2	1	10	3
5	1.0	5	2	2	2	1.0	3
5	1.0	5	2	2	2	2.0	3
5	1.0	5	2	2	2	3.0	3
5	1.0	5	2	2	2	4.0	3
5	1.0	5	2	2	2	5.0	3
5	1.0	5	2	2	2	6.0	3
5	1.0	5	2	2	2	7.0	3
5	1.0	5	2	2	2	8.0	3
5	1.0	5	2	2	2	9.0	.
5	1.0	5	2	2	2	10	3
5	1.0	5	2	3	1	1.0	11
5	1.0	5	2	3	1	2.0	11
5	1.0	5	2	3	1	3.0	11
5	1.0	5	2	3	1	4.0	11
5	1.0	5	2	3	1	5.0	11
5	1.0	5	2	3	1	6.0	11
5	1.0	5	2	3	1	7.0	11
5	1.0	5	2	3	1	8.0	11
5	1.0	5	2	3	1	9.0	.
5	1.0	5	2	3	1	10	11
5	1.0	5	2	3	2	1.0	7

A	B	C	D	E	F	G	H
5	1.0	5	2	3	2	2.0	7
5	1.0	5	2	3	2	3.0	7
5	1.0	5	2	3	2	4.0	7
5	1.0	5	2	3	2	5.0	7
5	1.0	5	2	3	2	6.0	7
5	1.0	5	2	3	2	7.0	7
5	1.0	5	2	3	2	8.0	7
5	1.0	5	2	3	2	9.0	.
5	1.0	5	2	3	2	10	7
5	2.0	1	1	1	1	2.0	0
5	2.0	1	1	1	1	3.0	0
5	2.0	1	1	1	1	4.0	0
5	2.0	1	1	1	1	5.0	0
5	2.0	1	1	1	1	6.0	0
5	2.0	1	1	1	1	7.0	0
5	2.0	1	1	1	1	8.0	0
5	2.0	1	1	1	1	9.0	0
5	2.0	1	1	1	1	10	0
5	2.0	1	1	1	2	2.0	0
5	2.0	1	1	1	2	3.0	0
5	2.0	1	1	1	2	4.0	0
5	2.0	1	1	1	2	5.0	0
5	2.0	1	1	1	2	6.0	0
5	2.0	1	1	1	2	7.0	0
5	2.0	1	1	1	2	8.0	0
5	2.0	1	1	1	2	9.0	0
5	2.0	1	1	1	2	10	0
5	2.0	1	1	2	1	2.0	0
5	2.0	1	1	2	1	3.0	0
5	2.0	1	1	2	1	4.0	0
5	2.0	1	1	2	1	5.0	0
5	2.0	1	1	2	1	6.0	0
5	2.0	1	1	2	1	7.0	0
5	2.0	1	1	2	1	8.0	0
5	2.0	1	1	2	1	9.0	0
5	2.0	1	1	2	1	10	0
5	2.0	1	1	2	2	2.0	0
5	2.0	1	1	2	2	3.0	0
5	2.0	1	1	2	2	4.0	0
5	2.0	1	1	2	2	5.0	0
5	2.0	1	1	2	2	6.0	0
5	2.0	1	1	2	2	7.0	0
5	2.0	1	1	2	2	8.0	0
5	2.0	1	1	2	2	9.0	0
5	2.0	1	1	2	2	10	0
5	2.0	1	1	3	1	2.0	0
5	2.0	1	1	3	1	3.0	0
5	2.0	1	1	3	1	4.0	0
5	2.0	1	1	3	1	5.0	0
5	2.0	1	1	3	1	6.0	0
5	2.0	1	1	3	1	7.0	0
5	2.0	1	1	3	1	8.0	0
5	2.0	1	1	3	1	9.0	0
5	2.0	1	1	3	1	10	0
5	2.0	1	1	3	2	2.0	1
5	2.0	1	1	3	2	3.0	1
5	2.0	1	1	3	2	4.0	1
5	2.0	1	1	3	2	5.0	1
5	2.0	1	1	3	2	6.0	1
5	2.0	1	1	3	2	7.0	1
5	2.0	1	1	3	2	8.0	1
5	2.0	1	1	3	2	9.0	1
5	2.0	1	1	3	2	10	1
5	2.0	1	2	1	1	2.0	0
5	2.0	1	2	1	1	3.0	0
5	2.0	1	2	1	1	4.0	0
5	2.0	1	2	1	1	5.0	0
5	2.0	1	2	1	1	6.0	0
5	2.0	1	2	1	1	7.0	0
5	2.0	1	2	1	1	8.0	0
5	2.0	1	2	1	1	9.0	0
5	2.0	1	2	1	1	10	0
5	2.0	1	2	1	2	2.0	2
5	2.0	1	2	1	2	3.0	2
5	2.0	1	2	1	2	4.0	2
5	2.0	1	2	1	2	5.0	2
5	2.0	1	2	1	2	6.0	2
5	2.0	1	2	1	2	7.0	2
5	2.0	1	2	1	2	8.0	2
5	2.0	1	2	1	2	9.0	2
5	2.0	1	2	1	2	10	2
5	2.0	1	2	2	1	2.0	0
5	2.0	1	2	2	1	3.0	0
5	2.0	1	2	2	1	4.0	0
5	2.0	1	2	2	1	5.0	0
5	2.0	1	2	2	1	6.0	0
5	2.0	1	2	2	1	7.0	0
5	2.0	1	2	2	1	8.0	0
5	2.0	1	2	2	1	9.0	0
5	2.0	1	2	2	1	10	0
5	2.0	1	2	2	2	2.0	3
5	2.0	1	2	2	2	3.0	2
5	2.0	1	2	2	2	4.0	1
5	2.0	1	2	2	2	5.0	1
5	2.0	1	2	2	2	6.0	1
5	2.0	1	2	2	2	7.0	1
5	2.0	1	2	2	2	8.0	1
5	2.0	1	2	2	2	9.0	1
5	2.0	1	2	2	2	10	1
5	2.0	1	2	3	1	2.0	1
5	2.0	1	2	3	1	3.0	1
5	2.0	1	2	3	1	4.0	1
5	2.0	1	2	3	1	5.0	1
5	2.0	1	2	3	1	6.0	1
5	2.0	1	2	3	1	7.0	1
5	2.0	1	2	3	1	8.0	1
5	2.0	1	2	3	1	9.0	1
5	2.0	1	2	3	1	10	1
5	2.0	1	2	3	2	2.0	1
5	2.0	1	2	3	2	3.0	1
5	2.0	1	2	3	2	4.0	1
5	2.0	1	2	3	2	5.0	1
5	2.0	1	2	3	2	6.0	1
5	2.0	1	2	3	2	7.0	1
5	2.0	1	2	3	2	8.0	1
5	2.0	1	2	3	2	9.0	1
5	2.0	1	2	3	2	10	1
5	2.0	2	1	1	1	2.0	0
5	2.0	2	1	1	1	3.0	0
5	2.0	2	1	1	1	4.0	0
5	2.0	2	1	1	1	5.0	0
5	2.0	2	1	1	1	6.0	0
5	2.0	2	1	1	1	7.0	0
5	2.0	2	1	1	1	8.0	0
5	2.0	2	1	1	1	9.0	0
5	2.0	2	1	1	1	10	0
5	2.0	2	1	1	2	2.0	0
5	2.0	2	1	1	2	3.0	0
5	2.0	2	1	1	2	4.0	0
5	2.0	2	1	1	2	5.0	0
5	2.0	2	1	1	2	6.0	0
5	2.0	2	1	1	2	7.0	0
5	2.0	2	1	1	2	8.0	0
5	2.0	2	1	1	2	9.0	0
5	2.0	2	1	1	2	10	0
5	2.0	2	1	2	1	2.0	0
5	2.0	2	1	2	1	3.0	0
5	2.0	2	1	2	1	4.0	0
5	2.0	2	1	2	1	5.0	0
5	2.0	2	1	2	1	6.0	0
5	2.0	2	1	2	1	7.0	0
5	2.0	2	1	2	1	8.0	0
5	2.0	2	1	2	1	9.0	0
5	2.0	2	1	2	1	10	0
5	2.0	2	1	2	2	2.0	0
5	2.0	2	1	2	2	3.0	0
5	2.0	2	1	2	2	4.0	0
5	2.0	2	1	2	2	5.0	0
5	2.0	2	1	2	2	6.0	0
5	2.0	2	1	2	2	7.0	0
5	2.0	2	1	2	2	8.0	0
5	2.0	2	1	2	2	9.0	0
5	2.0	2	1	2	2	10	0
5	2.0	2	1	3	1	2.0	0
5	2.0	2	1	3	1	3.0	0
5	2.0	2	1	3	1	4.0	0
5	2.0	2	1	3	1	5.0	0
5	2.0	2	1	3	1	6.0	0
5	2.0	2	1	3	1	7.0	0
5	2.0	2	1	3	1	8.0	0
5	2.0	2	1	3	1	9.0	0
5	2.0	2	1	3	1	10	0
5	2.0	2	1	3	2	2.0	1
5	2.0	2	1	3	2	3.0	1
5	2.0	2	1	3	2	4.0	1
5	2.0	2	1	3	2	5.0	1
5	2.0	2	1	3	2	6.0	1
5	2.0	2	1	3	2	7.0	1
5	2.0	2	1	3	2	8.0	1
5	2.0	2	1	3	2	9.0	1
5	2.0	2	1	3	2	10	1
5	2.0	2	2	1	1	2.0	1
5	2.0	2	2	1	1	3.0	1
5	2.0	2	2	1	1	4.0	1
5	2.0	2	2	1	1	5.0	1
5	2.0	2	2	1	1	6.0	1
5	2.0	2	2	1	1	7.0	1
5	2.0	2	2	1	1	8.0	1
5	2.0	2	2	1	1	9.0	1
5	2.0	2	2	1	1	10	1
5	2.0	2	2	1	2	2.0	0
5	2.0	2	2	1	2	3.0	0
5	2.0	2	2	1	2	4.0	0
5	2.0	2	2	1	2	5.0	0
5	2.0	2	2	1	2	6.0	0
5	2.0	2	2	1	2	7.0	0
5	2.0	2	2	1	2	8.0	0
5	2.0	2	2	1	2	9.0	0
5	2.0	2	2	1	2	10	0
5	2.0	2	2	2	1	2.0	0
5	2.0	2	2	2	1	3.0	0
5	2.0	2	2	2	1	4.0	0
5	2.0	2	2	2	1	5.0	0
5	2.0	2	2	2	1	6.0	0
5	2.0	2	2	2	1	7.0	0
5	2.0	2	2	2	1	8.0	0
5	2.0	2	2	2	1	9.0	0
5	2.0	2	2	2	1	10	0

A	B	C	D	E	F	G	H
5	2.0	2	2	2	2	2.0	0
5	2.0	2	2	2	2	3.0	0
5	2.0	2	2	2	2	4.0	0
5	2.0	2	2	2	2	5.0	0
5	2.0	2	2	2	2	6.0	0
5	2.0	2	2	2	2	7.0	0
5	2.0	2	2	2	2	8.0	0
5	2.0	2	2	2	2	9.0	0
5	2.0	2	2	2	2	10	0
5	2.0	2	2	3	1	2.0	2
5	2.0	2	2	3	1	3.0	2
5	2.0	2	2	3	1	4.0	2
5	2.0	2	2	3	1	5.0	2
5	2.0	2	2	3	1	6.0	2
5	2.0	2	2	3	1	7.0	2
5	2.0	2	2	3	1	8.0	2
5	2.0	2	2	3	1	9.0	2
5	2.0	2	2	3	1	10	2
5	2.0	2	2	3	2	2.0	0
5	2.0	2	2	3	2	3.0	0
5	2.0	2	2	3	2	4.0	0
5	2.0	2	2	3	2	5.0	0
5	2.0	2	2	3	2	6.0	0
5	2.0	2	2	3	2	7.0	0
5	2.0	2	2	3	2	8.0	0
5	2.0	2	2	3	2	9.0	0
5	2.0	2	2	3	2	10	0
5	2.0	3	1	1	1	2.0	0
5	2.0	3	1	1	1	3.0	0
5	2.0	3	1	1	1	4.0	0
5	2.0	3	1	1	1	5.0	0
5	2.0	3	1	1	1	6.0	0
5	2.0	3	1	1	1	7.0	0
5	2.0	3	1	1	1	8.0	0
5	2.0	3	1	1	1	9.0	0
5	2.0	3	1	1	1	10	0
5	2.0	3	1	1	2	2.0	1
5	2.0	3	1	1	2	3.0	1
5	2.0	3	1	1	2	4.0	1
5	2.0	3	1	1	2	5.0	1
5	2.0	3	1	1	2	6.0	1
5	2.0	3	1	1	2	7.0	1
5	2.0	3	1	1	2	8.0	1
5	2.0	3	1	1	2	9.0	1
5	2.0	3	1	1	2	10	1
5	2.0	3	1	2	1	2.0	0
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5	2.0	3	1	2	1	4.0	0
5	2.0	3	1	2	1	5.0	0
5	2.0	3	1	2	1	6.0	0
5	2.0	3	1	2	1	7.0	0
5	2.0	3	1	2	1	8.0	0
5	2.0	3	1	2	1	9.0	0
5	2.0	3	1	2	1	10	0
5	2.0	3	1	2	2	2.0	0
5	2.0	3	1	2	2	3.0	0
5	2.0	3	1	2	2	4.0	0
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5	2.0	3	1	2	2	6.0	0
5	2.0	3	1	2	2	7.0	0
5	2.0	3	1	2	2	8.0	0
5	2.0	3	1	2	2	9.0	0
5	2.0	3	1	2	2	10	0
5	2.0	3	1	3	1	2.0	0
5	2.0	3	1	3	1	3.0	0
5	2.0	3	1	3	1	4.0	0
5	2.0	3	1	3	1	5.0	0
5	2.0	3	1	3	1	6.0	0
5	2.0	3	1	3	1	7.0	0
5	2.0	3	1	3	1	8.0	0
5	2.0	3	1	3	1	9.0	0
5	2.0	3	1	3	1	10	0
5	2.0	3	1	3	2	2.0	0
5	2.0	3	1	3	2	3.0	0
5	2.0	3	1	3	2	4.0	0
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5	2.0	3	1	3	2	7.0	0
5	2.0	3	1	3	2	8.0	0
5	2.0	3	1	3	2	9.0	0
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5	2.0	3	2	1	1	3.0	1
5	2.0	3	2	1	1	4.0	1
5	2.0	3	2	1	1	5.0	1
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5	2.0	3	2	1	1	7.0	1
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5	2.0	3	2	1	2	2.0	3
5	2.0	3	2	1	2	3.0	3
5	2.0	3	2	1	2	4.0	3
5	2.0	3	2	1	2	5.0	3
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5	2.0	3	2	1	2	7.0	3
5	2.0	3	2	1	2	8.0	3
5	2.0	3	2	1	2	9.0	3
5	2.0	3	2	1	2	10	3
5	2.0	3	2	2	1	2.0	0
5	2.0	3	2	2	1	3.0	0
5	2.0	3	2	2	1	4.0	0
5	2.0	3	2	2	1	5.0	0
5	2.0	3	2	2	1	6.0	0
5	2.0	3	2	2	1	7.0	0
5	2.0	3	2	2	1	8.0	0
5	2.0	3	2	2	1	9.0	0
5	2.0	3	2	2	1	10	0
5	2.0	3	2	2	2	2.0	1
5	2.0	3	2	2	2	3.0	1
5	2.0	3	2	2	2	4.0	1
5	2.0	3	2	2	2	5.0	1
5	2.0	3	2	2	2	6.0	1
5	2.0	3	2	2	2	7.0	1
5	2.0	3	2	2	2	8.0	1
5	2.0	3	2	2	2	9.0	1
5	2.0	3	2	2	2	10	1
5	2.0	3	2	3	1	2.0	2
5	2.0	3	2	3	1	3.0	2
5	2.0	3	2	3	1	4.0	2
5	2.0	3	2	3	1	5.0	2
5	2.0	3	2	3	1	6.0	2
5	2.0	3	2	3	1	7.0	2
5	2.0	3	2	3	1	8.0	2
5	2.0	3	2	3	1	9.0	2
5	2.0	3	2	3	1	10	2
5	2.0	3	2	3	2	2.0	2
5	2.0	3	2	3	2	3.0	2
5	2.0	3	2	3	2	4.0	2
5	2.0	3	2	3	2	5.0	2
5	2.0	3	2	3	2	6.0	2
5	2.0	3	2	3	2	7.0	2
5	2.0	3	2	3	2	8.0	2
5	2.0	3	2	3	2	9.0	2
5	2.0	3	2	3	2	10	2
5	2.0	4	1	1	1	2.0	0
5	2.0	4	1	1	1	3.0	0
5	2.0	4	1	1	1	4.0	0
5	2.0	4	1	1	1	5.0	0
5	2.0	4	1	1	1	6.0	0
5	2.0	4	1	1	1	7.0	0
5	2.0	4	1	1	1	8.0	0
5	2.0	4	1	1	1	9.0	0
5	2.0	4	1	1	1	10	0
5	2.0	4	1	1	2	2.0	0
5	2.0	4	1	1	2	3.0	0
5	2.0	4	1	1	2	4.0	0
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5	2.0	4	1	1	2	6.0	0
5	2.0	4	1	1	2	7.0	0
5	2.0	4	1	1	2	8.0	0
5	2.0	4	1	1	2	9.0	0
5	2.0	4	1	1	2	10	0
5	2.0	4	1	2	1	2.0	0
5	2.0	4	1	2	1	3.0	0
5	2.0	4	1	2	1	4.0	0
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5	2.0	4	1	2	1	7.0	0
5	2.0	4	1	2	1	8.0	0
5	2.0	4	1	2	1	9.0	0
5	2.0	4	1	2	1	10	0
5	2.0	4	1	2	2	2.0	0
5	2.0	4	1	2	2	3.0	0
5	2.0	4	1	2	2	4.0	0
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5	2.0	4	1	2	2	7.0	0
5	2.0	4	1	2	2	8.0	0
5	2.0	4	1	2	2	9.0	0
5	2.0	4	1	2	2	10	0
5	2.0	4	1	3	1	2.0	0
5	2.0	4	1	3	1	3.0	0
5	2.0	4	1	3	1	4.0	0
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5	2.0	4	1	3	1	7.0	0
5	2.0	4	1	3	1	8.0	0
5	2.0	4	1	3	1	9.0	0
5	2.0	4	1	3	1	10	0
5	2.0	4	1	3	2	2.0	0
5	2.0	4	1	3	2	3.0	0
5	2.0	4	1	3	2	4.0	0
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5	2.0	4	1	3	2	7.0	0
5	2.0	4	1	3	2	8.0	0
5	2.0	4	1	3	2	9.0	0
5	2.0	4	1	3	2	10	0
5	2.0	4	2	1	1	2.0	2
5	2.0	4	2	1	1	3.0	2
5	2.0	4	2	1	1	4.0	2
5	2.0	4	2	1	1	5.0	2
5	2.0	4	2	1	1	6.0	2
5	2.0	4	2	1	1	7.0	2
5	2.0	4	2	1	1	8.0	2
5	2.0	4	2	1	1	9.0	2
5	2.0	4	2	1	1	10	2

A	B	C	D	E	F	G	H
5	2.0	4	2	1	2	2.0	0
5	2.0	4	2	1	2	3.0	0
5	2.0	4	2	1	2	4.0	0
5	2.0	4	2	1	2	5.0	0
5	2.0	4	2	1	2	6.0	0
5	2.0	4	2	1	2	7.0	0
5	2.0	4	2	1	2	8.0	0
5	2.0	4	2	1	2	9.0	0
5	2.0	4	2	1	2	10	0
5	2.0	4	2	2	1	2.0	0
5	2.0	4	2	2	1	3.0	0
5	2.0	4	2	2	1	4.0	0
5	2.0	4	2	2	1	5.0	0
5	2.0	4	2	2	1	6.0	0
5	2.0	4	2	2	1	7.0	0
5	2.0	4	2	2	1	8.0	0
5	2.0	4	2	2	1	9.0	0
5	2.0	4	2	2	1	10	0
5	2.0	4	2	2	2	2.0	0
5	2.0	4	2	2	2	3.0	0
5	2.0	4	2	2	2	4.0	0
5	2.0	4	2	2	2	5.0	0
5	2.0	4	2	2	2	6.0	0
5	2.0	4	2	2	2	7.0	0
5	2.0	4	2	2	2	8.0	0
5	2.0	4	2	2	2	9.0	0
5	2.0	4	2	2	2	10	0
5	2.0	4	2	3	1	2.0	0
5	2.0	4	2	3	1	3.0	0
5	2.0	4	2	3	1	4.0	0
5	2.0	4	2	3	1	5.0	0
5	2.0	4	2	3	1	6.0	0
5	2.0	4	2	3	1	7.0	0
5	2.0	4	2	3	1	8.0	0
5	2.0	4	2	3	1	9.0	0
5	2.0	4	2	3	1	10	0
5	2.0	4	2	3	2	2.0	0
5	2.0	4	2	3	2	3.0	0
5	2.0	4	2	3	2	4.0	0
5	2.0	4	2	3	2	5.0	0
5	2.0	4	2	3	2	6.0	0
5	2.0	4	2	3	2	7.0	0
5	2.0	4	2	3	2	8.0	0
5	2.0	4	2	3	2	9.0	0
5	2.0	4	2	3	2	10	0
5	2.0	5	1	1	1	2.0	1
5	2.0	5	1	1	1	3.0	1
5	2.0	5	1	1	1	4.0	1
5	2.0	5	1	1	1	5.0	1
5	2.0	5	1	1	1	6.0	1
5	2.0	5	1	1	1	7.0	1
5	2.0	5	1	1	1	8.0	1
5	2.0	5	1	1	1	9.0	1
5	2.0	5	1	1	1	10	1
5	2.0	5	1	1	2	2.0	2
5	2.0	5	1	1	2	3.0	2
5	2.0	5	1	1	2	4.0	2
5	2.0	5	1	1	2	5.0	2
5	2.0	5	1	1	2	6.0	2
5	2.0	5	1	1	2	7.0	2
5	2.0	5	1	1	2	8.0	2
5	2.0	5	1	1	2	9.0	.
5	2.0	5	1	1	2	10	2
5	2.0	5	1	2	1	2.0	0
5	2.0	5	1	2	1	3.0	0
5	2.0	5	1	2	1	4.0	0

A	B	C	D	E	F	G	H
5	2.0	5	1	2	1	5.0	0
5	2.0	5	1	2	1	6.0	0
5	2.0	5	1	2	1	7.0	0
5	2.0	5	1	2	1	8.0	0
5	2.0	5	1	2	1	9.0	0
5	2.0	5	1	2	1	10	0
5	2.0	5	1	2	2	2.0	0
5	2.0	5	1	2	2	3.0	0
5	2.0	5	1	2	2	4.0	0
5	2.0	5	1	2	2	5.0	0
5	2.0	5	1	2	2	6.0	0
5	2.0	5	1	2	2	7.0	0
5	2.0	5	1	2	2	8.0	0
5	2.0	5	1	2	2	9.0	0
5	2.0	5	1	2	2	10	0
5	2.0	5	1	3	1	2.0	0
5	2.0	5	1	3	1	3.0	0
5	2.0	5	1	3	1	4.0	0
5	2.0	5	1	3	1	5.0	0
5	2.0	5	1	3	1	6.0	0
5	2.0	5	1	3	1	7.0	0
5	2.0	5	1	3	1	8.0	0
5	2.0	5	1	3	1	9.0	0
5	2.0	5	1	3	1	10	0
5	2.0	5	1	3	2	2.0	1
5	2.0	5	1	3	2	3.0	1
5	2.0	5	1	3	2	4.0	1
5	2.0	5	1	3	2	5.0	1
5	2.0	5	1	3	2	6.0	1
5	2.0	5	1	3	2	7.0	1
5	2.0	5	1	3	2	8.0	1
5	2.0	5	1	3	2	9.0	1
5	2.0	5	1	3	2	10	1
5	2.0	5	2	1	1	2.0	5
5	2.0	5	2	1	1	3.0	5
5	2.0	5	2	1	1	4.0	5
5	2.0	5	2	1	1	5.0	5
5	2.0	5	2	1	1	6.0	5
5	2.0	5	2	1	1	7.0	5
5	2.0	5	2	1	1	8.0	5
5	2.0	5	2	1	1	9.0	.
5	2.0	5	2	1	1	10	5
5	2.0	5	2	1	2	2.0	6
5	2.0	5	2	1	2	3.0	6
5	2.0	5	2	1	2	4.0	5
5	2.0	5	2	1	2	5.0	5
5	2.0	5	2	1	2	6.0	5
5	2.0	5	2	1	2	7.0	5
5	2.0	5	2	1	2	8.0	5
5	2.0	5	2	1	2	9.0	5
5	2.0	5	2	1	2	10	5
5	2.0	5	2	2	1	2.0	5
5	2.0	5	2	2	1	3.0	5
5	2.0	5	2	2	1	4.0	5
5	2.0	5	2	2	1	5.0	5
5	2.0	5	2	2	1	6.0	5
5	2.0	5	2	2	1	7.0	5
5	2.0	5	2	2	1	8.0	5
5	2.0	5	2	2	1	9.0	.
5	2.0	5	2	2	1	10	3
5	2.0	5	2	2	2	2.0	5
5	2.0	5	2	2	2	3.0	5
5	2.0	5	2	2	2	4.0	5
5	2.0	5	2	2	2	5.0	5
5	2.0	5	2	2	2	6.0	5
5	2.0	5	2	2	2	7.0	5

A	B	C	D	E	F	G	H
5	2.0	5	2	2	2	8.0	5
5	2.0	5	2	2	2	9.0	.
5	2.0	5	2	2	2	10	5
5	2.0	5	2	3	1	2.0	3
5	2.0	5	2	3	1	3.0	3
5	2.0	5	2	3	1	4.0	3
5	2.0	5	2	3	1	5.0	3
5	2.0	5	2	3	1	6.0	3
5	2.0	5	2	3	1	7.0	3
5	2.0	5	2	3	1	8.0	3
5	2.0	5	2	3	1	9.0	.
5	2.0	5	2	3	1	10	3
5	2.0	5	2	3	2	2.0	4
5	2.0	5	2	3	2	3.0	4
5	2.0	5	2	3	2	4.0	4
5	2.0	5	2	3	2	5.0	4
5	2.0	5	2	3	2	6.0	4
5	2.0	5	2	3	2	7.0	4
5	2.0	5	2	3	2	8.0	4
5	2.0	5	2	3	2	9.0	.
5	2.0	5	2	3	2	10	3
5	3.0	1	1	1	1	3.0	7
5	3.0	1	1	1	1	4.0	7
5	3.0	1	1	1	1	5.0	7
5	3.0	1	1	1	1	6.0	7
5	3.0	1	1	1	1	7.0	7
5	3.0	1	1	1	1	8.0	7
5	3.0	1	1	1	1	9.0	7
5	3.0	1	1	1	1	10	7
5	3.0	1	1	1	2	3.0	5
5	3.0	1	1	1	2	4.0	5
5	3.0	1	1	1	2	5.0	5
5	3.0	1	1	1	2	6.0	5
5	3.0	1	1	1	2	7.0	5
5	3.0	1	1	1	2	8.0	5
5	3.0	1	1	1	2	9.0	5
5	3.0	1	1	1	2	10	5
5	3.0	1	1	2	1	3.0	2
5	3.0	1	1	2	1	4.0	2
5	3.0	1	1	2	1	5.0	2
5	3.0	1	1	2	1	6.0	2
5	3.0	1	1	2	1	7.0	2
5	3.0	1	1	2	1	8.0	2
5	3.0	1	1	2	1	9.0	2
5	3.0	1	1	2	1	10	2
5	3.0	1	1	2	2	3.0	6
5	3.0	1	1	2	2	4.0	6
5	3.0	1	1	2	2	5.0	6
5	3.0	1	1	2	2	6.0	6
5	3.0	1	1	2	2	7.0	6
5	3.0	1	1	2	2	8.0	6
5	3.0	1	1	2	2	9.0	6
5	3.0	1	1	2	2	10	6
5	3.0	1	1	3	1	3.0	4
5	3.0	1	1	3	1	4.0	4
5	3.0	1	1	3	1	5.0	4
5	3.0	1	1	3	1	6.0	4
5	3.0	1	1	3	1	7.0	4
5	3.0	1	1	3	1	8.0	4
5	3.0	1	1	3	1	9.0	4
5	3.0	1	1	3	1	10	4
5	3.0	1	1	3	2	3.0	7
5	3.0	1	1	3	2	4.0	6
5	3.0	1	1	3	2	5.0	6
5	3.0	1	1	3	2	6.0	6
5	3.0	1	1	3	2	7.0	6

A	B	C	D	E	F	G	H
5	3.0	1	1	3	2	8.0	6
5	3.0	1	1	3	2	9.0	6
5	3.0	1	1	3	2	10	6
5	3.0	1	2	1	1	3.0	4
5	3.0	1	2	1	1	4.0	4
5	3.0	1	2	1	1	5.0	3
5	3.0	1	2	1	1	6.0	3
5	3.0	1	2	1	1	7.0	3
5	3.0	1	2	1	1	8.0	3
5	3.0	1	2	1	1	9.0	3
5	3.0	1	2	1	1	10	3
5	3.0	1	2	1	2	3.0	7
5	3.0	1	2	1	2	4.0	7
5	3.0	1	2	1	2	5.0	7
5	3.0	1	2	1	2	6.0	7
5	3.0	1	2	1	2	7.0	7
5	3.0	1	2	1	2	8.0	7
5	3.0	1	2	1	2	9.0	7
5	3.0	1	2	1	2	10	7
5	3.0	1	2	2	1	3.0	1
5	3.0	1	2	2	1	4.0	1
5	3.0	1	2	2	1	5.0	1
5	3.0	1	2	2	1	6.0	1
5	3.0	1	2	2	1	7.0	1
5	3.0	1	2	2	1	8.0	1
5	3.0	1	2	2	1	9.0	1
5	3.0	1	2	2	1	10	1
5	3.0	1	2	2	2	3.0	3
5	3.0	1	2	2	2	4.0	3
5	3.0	1	2	2	2	5.0	3
5	3.0	1	2	2	2	6.0	3
5	3.0	1	2	2	2	7.0	3
5	3.0	1	2	2	2	8.0	3
5	3.0	1	2	2	2	9.0	3
5	3.0	1	2	2	2	10	3
5	3.0	1	2	3	1	3.0	3
5	3.0	1	2	3	1	4.0	2
5	3.0	1	2	3	1	5.0	2
5	3.0	1	2	3	1	6.0	2
5	3.0	1	2	3	1	7.0	2
5	3.0	1	2	3	1	8.0	2
5	3.0	1	2	3	1	9.0	2
5	3.0	1	2	3	1	10	2
5	3.0	1	2	3	2	3.0	1
5	3.0	1	2	3	2	4.0	1
5	3.0	1	2	3	2	5.0	1
5	3.0	1	2	3	2	6.0	1
5	3.0	1	2	3	2	7.0	1
5	3.0	1	2	3	2	8.0	1
5	3.0	1	2	3	2	9.0	1
5	3.0	1	2	3	2	10	1
5	3.0	2	1	1	1	3.0	2
5	3.0	2	1	1	1	4.0	2
5	3.0	2	1	1	1	5.0	2
5	3.0	2	1	1	1	6.0	2
5	3.0	2	1	1	1	7.0	2
5	3.0	2	1	1	1	8.0	2
5	3.0	2	1	1	1	9.0	2
5	3.0	2	1	1	1	10	2
5	3.0	2	1	1	2	3.0	4
5	3.0	2	1	1	2	4.0	4
5	3.0	2	1	1	2	5.0	4
5	3.0	2	1	1	2	6.0	4
5	3.0	2	1	1	2	7.0	4
5	3.0	2	1	1	2	8.0	4
5	3.0	2	1	1	2	9.0	4

A	B	C	D	E	F	G	H
5	3.0	2	1	1	2	10	4
5	3.0	2	1	2	1	3.0	2
5	3.0	2	1	2	1	4.0	2
5	3.0	2	1	2	1	5.0	2
5	3.0	2	1	2	1	6.0	2
5	3.0	2	1	2	1	7.0	2
5	3.0	2	1	2	1	8.0	2
5	3.0	2	1	2	1	9.0	2
5	3.0	2	1	2	1	10	2
5	3.0	2	1	2	2	3.0	5
5	3.0	2	1	2	2	4.0	5
5	3.0	2	1	2	2	5.0	5
5	3.0	2	1	2	2	6.0	5
5	3.0	2	1	2	2	7.0	5
5	3.0	2	1	2	2	8.0	5
5	3.0	2	1	2	2	9.0	5
5	3.0	2	1	2	2	10	5
5	3.0	2	1	3	1	3.0	5
5	3.0	2	1	3	1	4.0	4
5	3.0	2	1	3	1	5.0	4
5	3.0	2	1	3	1	6.0	4
5	3.0	2	1	3	1	7.0	4
5	3.0	2	1	3	1	8.0	4
5	3.0	2	1	3	1	9.0	4
5	3.0	2	1	3	1	10	4
5	3.0	2	1	3	2	3.0	0
5	3.0	2	1	3	2	4.0	0
5	3.0	2	1	3	2	5.0	0
5	3.0	2	1	3	2	6.0	0
5	3.0	2	1	3	2	7.0	0
5	3.0	2	1	3	2	8.0	0
5	3.0	2	1	3	2	9.0	0
5	3.0	2	1	3	2	10	0
5	3.0	2	2	1	1	3.0	5
5	3.0	2	2	1	1	4.0	5
5	3.0	2	2	1	1	5.0	5
5	3.0	2	2	1	1	6.0	5
5	3.0	2	2	1	1	7.0	5
5	3.0	2	2	1	1	8.0	5
5	3.0	2	2	1	1	9.0	5
5	3.0	2	2	1	1	10	5
5	3.0	2	2	1	2	3.0	4
5	3.0	2	2	1	2	4.0	4
5	3.0	2	2	1	2	5.0	4
5	3.0	2	2	1	2	6.0	4
5	3.0	2	2	1	2	7.0	4
5	3.0	2	2	1	2	8.0	4
5	3.0	2	2	1	2	9.0	4
5	3.0	2	2	1	2	10	4
5	3.0	2	2	2	1	3.0	7
5	3.0	2	2	2	1	4.0	7
5	3.0	2	2	2	1	5.0	7
5	3.0	2	2	2	1	6.0	7
5	3.0	2	2	2	1	7.0	7
5	3.0	2	2	2	1	8.0	7
5	3.0	2	2	2	1	9.0	7
5	3.0	2	2	2	1	10	7
5	3.0	2	2	2	2	3.0	3
5	3.0	2	2	2	2	4.0	3
5	3.0	2	2	2	2	5.0	3
5	3.0	2	2	2	2	6.0	3
5	3.0	2	2	2	2	7.0	3
5	3.0	2	2	2	2	8.0	3
5	3.0	2	2	2	2	9.0	3
5	3.0	2	2	2	2	10	3
5	3.0	2	2	3	1	3.0	1

A	B	C	D	E	F	G	H
5	3.0	2	2	3	1	4.0	1
5	3.0	2	2	3	1	5.0	1
5	3.0	2	2	3	1	6.0	1
5	3.0	2	2	3	1	7.0	1
5	3.0	2	2	3	1	8.0	1
5	3.0	2	2	3	1	9.0	1
5	3.0	2	2	3	1	10	1
5	3.0	2	2	3	2	3.0	8
5	3.0	2	2	3	2	4.0	7
5	3.0	2	2	3	2	5.0	7
5	3.0	2	2	3	2	6.0	7
5	3.0	2	2	3	2	7.0	7
5	3.0	2	2	3	2	8.0	7
5	3.0	2	2	3	2	9.0	7
5	3.0	2	2	3	2	10	7
5	3.0	3	1	1	1	3.0	6
5	3.0	3	1	1	1	4.0	6
5	3.0	3	1	1	1	5.0	6
5	3.0	3	1	1	1	6.0	6
5	3.0	3	1	1	1	7.0	6
5	3.0	3	1	1	1	8.0	6
5	3.0	3	1	1	1	9.0	6
5	3.0	3	1	1	1	10	6
5	3.0	3	1	1	2	3.0	1
5	3.0	3	1	1	2	4.0	1
5	3.0	3	1	1	2	5.0	1
5	3.0	3	1	1	2	6.0	1
5	3.0	3	1	1	2	7.0	1
5	3.0	3	1	1	2	8.0	1
5	3.0	3	1	1	2	9.0	1
5	3.0	3	1	1	2	10	1
5	3.0	3	1	2	1	3.0	4
5	3.0	3	1	2	1	4.0	3
5	3.0	3	1	2	1	5.0	3
5	3.0	3	1	2	1	6.0	3
5	3.0	3	1	2	1	7.0	3
5	3.0	3	1	2	1	8.0	3
5	3.0	3	1	2	1	9.0	3
5	3.0	3	1	2	1	10	3
5	3.0	3	1	2	2	3.0	6
5	3.0	3	1	2	2	4.0	6
5	3.0	3	1	2	2	5.0	6
5	3.0	3	1	2	2	6.0	6
5	3.0	3	1	2	2	7.0	6
5	3.0	3	1	2	2	8.0	5
5	3.0	3	1	2	2	9.0	5
5	3.0	3	1	2	2	10	5
5	3.0	3	1	3	1	3.0	3
5	3.0	3	1	3	1	4.0	3
5	3.0	3	1	3	1	5.0	3
5	3.0	3	1	3	1	6.0	3
5	3.0	3	1	3	1	7.0	3
5	3.0	3	1	3	1	8.0	3
5	3.0	3	1	3	1	9.0	3
5	3.0	3	1	3	1	10	3
5	3.0	3	1	3	2	3.0	6
5	3.0	3	1	3	2	4.0	5
5	3.0	3	1	3	2	5.0	5
5	3.0	3	1	3	2	6.0	5
5	3.0	3	1	3	2	7.0	5
5	3.0	3	1	3	2	8.0	5
5	3.0	3	1	3	2	9.0	5
5	3.0	3	1	3	2	10	5
5	3.0	3	2	1	1	3.0	8
5	3.0	3	2	1	1	4.0	8
5	3.0	3	2	1	1	5.0	8

A	B	C	D	E	F	G	H
5	3.0	3	2	1	1	6.0	8
5	3.0	3	2	1	1	7.0	8
5	3.0	3	2	1	1	8.0	8
5	3.0	3	2	1	1	9.0	8
5	3.0	3	2	1	1	10	8
5	3.0	3	2	1	2	3.0	9
5	3.0	3	2	1	2	4.0	9
5	3.0	3	2	1	2	5.0	9
5	3.0	3	2	1	2	6.0	9
5	3.0	3	2	1	2	7.0	9
5	3.0	3	2	1	2	8.0	9
5	3.0	3	2	1	2	9.0	9
5	3.0	3	2	1	2	10	9
5	3.0	3	2	2	1	3.0	7
5	3.0	3	2	2	1	4.0	7
5	3.0	3	2	2	1	5.0	7
5	3.0	3	2	2	1	6.0	7
5	3.0	3	2	2	1	7.0	7
5	3.0	3	2	2	1	8.0	7
5	3.0	3	2	2	1	9.0	7
5	3.0	3	2	2	1	10	7
5	3.0	3	2	2	2	3.0	6
5	3.0	3	2	2	2	4.0	6
5	3.0	3	2	2	2	5.0	6
5	3.0	3	2	2	2	6.0	6
5	3.0	3	2	2	2	7.0	6
5	3.0	3	2	2	2	8.0	6
5	3.0	3	2	2	2	9.0	6
5	3.0	3	2	2	2	10	6
5	3.0	3	2	3	1	3.0	6
5	3.0	3	2	3	1	4.0	6
5	3.0	3	2	3	1	5.0	6
5	3.0	3	2	3	1	6.0	6
5	3.0	3	2	3	1	7.0	6
5	3.0	3	2	3	1	8.0	6
5	3.0	3	2	3	1	9.0	6
5	3.0	3	2	3	1	10	6
5	3.0	3	2	3	2	3.0	9
5	3.0	3	2	3	2	4.0	9
5	3.0	3	2	3	2	5.0	9
5	3.0	3	2	3	2	6.0	9
5	3.0	3	2	3	2	7.0	9
5	3.0	3	2	3	2	8.0	9
5	3.0	3	2	3	2	9.0	9
5	3.0	3	2	3	2	10	9
5	3.0	4	1	1	1	3.0	11
5	3.0	4	1	1	1	4.0	9
5	3.0	4	1	1	1	5.0	9
5	3.0	4	1	1	1	6.0	9
5	3.0	4	1	1	1	7.0	9
5	3.0	4	1	1	1	8.0	9
5	3.0	4	1	1	1	9.0	9
5	3.0	4	1	1	1	10	9
5	3.0	4	1	1	2	3.0	9
5	3.0	4	1	1	2	4.0	7
5	3.0	4	1	1	2	5.0	7
5	3.0	4	1	1	2	6.0	7
5	3.0	4	1	1	2	7.0	7
5	3.0	4	1	1	2	8.0	7
5	3.0	4	1	1	2	9.0	7
5	3.0	4	1	1	2	10	7
5	3.0	4	1	2	1	3.0	3
5	3.0	4	1	2	1	4.0	2
5	3.0	4	1	2	1	5.0	2
5	3.0	4	1	2	1	6.0	2
5	3.0	4	1	2	1	7.0	2

A	B	C	D	E	F	G	H
5	3.0	4	1	2	1	8.0	2
5	3.0	4	1	2	1	9.0	2
5	3.0	4	1	2	1	10	2
5	3.0	4	1	2	2	3.0	15
5	3.0	4	1	2	2	4.0	15
5	3.0	4	1	2	2	5.0	15
5	3.0	4	1	2	2	6.0	15
5	3.0	4	1	2	2	7.0	15
5	3.0	4	1	2	2	8.0	15
5	3.0	4	1	2	2	9.0	15
5	3.0	4	1	2	2	10	15
5	3.0	4	1	3	1	3.0	10
5	3.0	4	1	3	1	4.0	10
5	3.0	4	1	3	1	5.0	10
5	3.0	4	1	3	1	6.0	10
5	3.0	4	1	3	1	7.0	10
5	3.0	4	1	3	1	8.0	10
5	3.0	4	1	3	1	9.0	.
5	3.0	4	1	3	1	10	10
5	3.0	4	1	3	2	3.0	8
5	3.0	4	1	3	2	4.0	8
5	3.0	4	1	3	2	5.0	8
5	3.0	4	1	3	2	6.0	8
5	3.0	4	1	3	2	7.0	8
5	3.0	4	1	3	2	8.0	8
5	3.0	4	1	3	2	9.0	.
5	3.0	4	1	3	2	10	8
5	3.0	4	2	1	1	3.0	6
5	3.0	4	2	1	1	4.0	6
5	3.0	4	2	1	1	5.0	6
5	3.0	4	2	1	1	6.0	6
5	3.0	4	2	1	1	7.0	6
5	3.0	4	2	1	1	8.0	6
5	3.0	4	2	1	1	9.0	6
5	3.0	4	2	1	1	10	6
5	3.0	4	2	1	2	3.0	5
5	3.0	4	2	1	2	4.0	5
5	3.0	4	2	1	2	5.0	5
5	3.0	4	2	1	2	6.0	5
5	3.0	4	2	1	2	7.0	5
5	3.0	4	2	1	2	8.0	5
5	3.0	4	2	1	2	9.0	5
5	3.0	4	2	1	2	10	5
5	3.0	4	2	2	1	3.0	6
5	3.0	4	2	2	1	4.0	6
5	3.0	4	2	2	1	5.0	6
5	3.0	4	2	2	1	6.0	6
5	3.0	4	2	2	1	7.0	6
5	3.0	4	2	2	1	8.0	6
5	3.0	4	2	2	1	9.0	.
5	3.0	4	2	2	1	10	6
5	3.0	4	2	2	2	3.0	3
5	3.0	4	2	2	2	4.0	3
5	3.0	4	2	2	2	5.0	3
5	3.0	4	2	2	2	6.0	3
5	3.0	4	2	2	2	7.0	3
5	3.0	4	2	2	2	8.0	3
5	3.0	4	2	2	2	9.0	3
5	3.0	4	2	2	2	10	3
5	3.0	4	2	3	1	3.0	4
5	3.0	4	2	3	1	4.0	4
5	3.0	4	2	3	1	5.0	4
5	3.0	4	2	3	1	6.0	4
5	3.0	4	2	3	1	7.0	4
5	3.0	4	2	3	1	8.0	4
5	3.0	4	2	3	1	9.0	.

A	B	C	D	E	F	G	H
5	3.0	4	2	3	1	10	4
5	3.0	4	2	3	2	3.0	8
5	3.0	4	2	3	2	4.0	8
5	3.0	4	2	3	2	5.0	8
5	3.0	4	2	3	2	6.0	8
5	3.0	4	2	3	2	7.0	8
5	3.0	4	2	3	2	8.0	7
5	3.0	4	2	3	2	9.0	.
5	3.0	4	2	3	2	10	5
5	3.0	5	1	1	1	3.0	14
5	3.0	5	1	1	1	4.0	14
5	3.0	5	1	1	1	5.0	14
5	3.0	5	1	1	1	6.0	14
5	3.0	5	1	1	1	7.0	14
5	3.0	5	1	1	1	8.0	14
5	3.0	5	1	1	1	9.0	.
5	3.0	5	1	1	1	10	14
5	3.0	5	1	1	2	3.0	11
5	3.0	5	1	1	2	4.0	11
5	3.0	5	1	1	2	5.0	11
5	3.0	5	1	1	2	6.0	11
5	3.0	5	1	1	2	7.0	11
5	3.0	5	1	1	2	8.0	11
5	3.0	5	1	1	2	9.0	.
5	3.0	5	1	1	2	10	11
5	3.0	5	1	2	1	3.0	10
5	3.0	5	1	2	1	4.0	9
5	3.0	5	1	2	1	5.0	9
5	3.0	5	1	2	1	6.0	9
5	3.0	5	1	2	1	7.0	9
5	3.0	5	1	2	1	8.0	9
5	3.0	5	1	2	1	9.0	.
5	3.0	5	1	2	1	10	9
5	3.0	5	1	2	2	3.0	15
5	3.0	5	1	2	2	4.0	15
5	3.0	5	1	2	2	5.0	15
5	3.0	5	1	2	2	6.0	15
5	3.0	5	1	2	2	7.0	15
5	3.0	5	1	2	2	8.0	15
5	3.0	5	1	2	2	9.0	.
5	3.0	5	1	2	2	10	15
5	3.0	5	1	3	1	3.0	8
5	3.0	5	1	3	1	4.0	8
5	3.0	5	1	3	1	5.0	8
5	3.0	5	1	3	1	6.0	8
5	3.0	5	1	3	1	7.0	8
5	3.0	5	1	3	1	8.0	8
5	3.0	5	1	3	1	9.0	.
5	3.0	5	1	3	1	10	8
5	3.0	5	1	3	2	3.0	6
5	3.0	5	1	3	2	4.0	6
5	3.0	5	1	3	2	5.0	6
5	3.0	5	1	3	2	6.0	6
5	3.0	5	1	3	2	7.0	6
5	3.0	5	1	3	2	8.0	6
5	3.0	5	1	3	2	9.0	.
5	3.0	5	1	3	2	10	6
5	3.0	5	2	1	1	3.0	18
5	3.0	5	2	1	1	4.0	18
5	3.0	5	2	1	1	5.0	17
5	3.0	5	2	1	1	6.0	17
5	3.0	5	2	1	1	7.0	16
5	3.0	5	2	1	1	8.0	16
5	3.0	5	2	1	1	9.0	16
5	3.0	5	2	1	1	10	16
5	3.0	5	2	1	2	3.0	8

A	B	C	D	E	F	G	H
5	3.0	5	2	1	2	4.0	8
5	3.0	5	2	1	2	5.0	8
5	3.0	5	2	1	2	6.0	8
5	3.0	5	2	1	2	7.0	8
5	3.0	5	2	1	2	8.0	8
5	3.0	5	2	1	2	9.0	8
5	3.0	5	2	1	2	10	8
5	3.0	5	2	2	1	3.0	4
5	3.0	5	2	2	1	4.0	3
5	3.0	5	2	2	1	5.0	3
5	3.0	5	2	2	1	6.0	3
5	3.0	5	2	2	1	7.0	3
5	3.0	5	2	2	1	8.0	3
5	3.0	5	2	2	1	9.0	.
5	3.0	5	2	2	1	10	3
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5	3.0	5	2	3	1	7.0	11
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5	4.0	2	1	2	1	8.0	0
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A	B	C	D	E	F	G	H
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A	B	C	D	E	F	G	H
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5	4.0	5	1	3	1	4.0	4
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A	B	C	D	E	F	G	H
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A	B	C	D	E	F	G	H
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5	5.0	5	2	2	1	8.0	1
5	5.0	5	2	2	1	9.0	.
5	5.0	5	2	2	1	10	.
5	5.0	5	2	2	2	5.0	2
5	5.0	5	2	2	2	6.0	2
5	5.0	5	2	2	2	7.0	2
5	5.0	5	2	2	2	8.0	2
5	5.0	5	2	2	2	9.0	2
5	5.0	5	2	2	2	10	2
5	5.0	5	2	3	1	5.0	0
5	5.0	5	2	3	1	6.0	0
5	5.0	5	2	3	1	7.0	0
5	5.0	5	2	3	1	8.0	0
5	5.0	5	2	3	1	9.0	0
5	5.0	5	2	3	1	10	0
5	5.0	5	2	3	2	5.0	0
5	5.0	5	2	3	2	6.0	0
5	5.0	5	2	3	2	7.0	0
5	5.0	5	2	3	2	8.0	0
5	5.0	5	2	3	2	9.0	0
5	5.0	5	2	3	2	10	0
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5	6.0	1	1	1	1	7.0	0
5	6.0	1	1	1	1	8.0	0
5	6.0	1	1	1	1	9.0	0
5	6.0	1	1	1	1	10	0
5	6.0	1	1	1	2	6.0	0
5	6.0	1	1	1	2	7.0	0
5	6.0	1	1	1	2	8.0	0
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5	6.0	1	1	1	2	10	0
5	6.0	1	1	2	1	6.0	0
5	6.0	1	1	2	1	7.0	0
5	6.0	1	1	2	1	8.0	0
5	6.0	1	1	2	1	9.0	0
5	6.0	1	1	2	1	10	0
5	6.0	1	1	2	2	6.0	0
5	6.0	1	1	2	2	7.0	0
5	6.0	1	1	2	2	8.0	0
5	6.0	1	1	2	2	9.0	0
5	6.0	1	1	2	2	10	0
5	6.0	1	1	3	1	6.0	1
5	6.0	1	1	3	1	7.0	1
5	6.0	1	1	3	1	8.0	1
5	6.0	1	1	3	1	9.0	1
5	6.0	1	1	3	1	10	1
5	6.0	1	1	3	2	6.0	0
5	6.0	1	1	3	2	7.0	0
5	6.0	1	1	3	2	8.0	0
5	6.0	1	1	3	2	9.0	0
5	6.0	1	1	3	2	10	0
5	6.0	1	2	L	1	6.0	0
5	6.0	1	2	1	1	7.0	0
5	6.0	1	2	1	1	8.0	0
5	6.0	1	2	1	1	9.0	0
5	6.0	1	2	1	1	10	0
5	6.0	1	2	1	2	6.0	0
5	6.0	1	2	1	2	7.0	0
5	6.0	1	2	1	2	8.0	0
5	6.0	1	2	1	2	9.0	0

A	B	C	D	E	F	G	H
5	6.0	1	2	1	2	10	0
5	6.0	1	2	2	1	6.0	0
5	6.0	1	2	2	1	7.0	0
5	6.0	1	2	2	1	8.0	0
5	6.0	1	2	2	1	9.0	0
5	6.0	1	2	2	1	10	0
5	6.0	1	2	2	2	6.0	0
5	6.0	1	2	2	2	7.0	0
5	6.0	1	2	2	2	8.0	0
5	6.0	1	2	2	2	9.0	0
5	6.0	1	2	2	2	10	0
5	6.0	1	2	3	1	6.0	0
5	6.0	1	2	3	1	7.0	0
5	6.0	1	2	3	1	8.0	0
5	6.0	1	2	3	1	9.0	0
5	6.0	1	2	3	1	10	0
5	6.0	1	2	3	2	6.0	0
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5	6.0	1	2	3	2	8.0	0
5	6.0	1	2	3	2	9.0	0
5	6.0	1	2	3	2	10	0
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5	6.0	2	1	1	1	10	0
5	6.0	2	1	1	2	6.0	0
5	6.0	2	1	1	2	7.0	0
5	6.0	2	1	1	2	8.0	0
5	6.0	2	1	1	2	9.0	0
5	6.0	2	1	1	2	10	0
5	6.0	2	1	2	1	6.0	0
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5	6.0	2	1	3	1	7.0	0
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5	6.0	2	1	3	1	9.0	0
5	6.0	2	1	3	1	10	0
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5	6.0	2	1	3	2	8.0	0
5	6.0	2	1	3	2	9.0	0
5	6.0	2	1	3	2	10	0
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5	6.0	2	2	1	1	7.0	0
5	6.0	2	2	1	1	8.0	0
5	6.0	2	2	1	1	9.0	0
5	6.0	2	2	1	1	10	0
5	6.0	2	2	1	2	6.0	0
5	6.0	2	2	1	2	7.0	0
5	6.0	2	2	1	2	8.0	0
5	6.0	2	2	1	2	9.0	0
5	6.0	2	2	1	2	10	0
5	6.0	2	2	2	1	6.0	0
5	6.0	2	2	2	1	7.0	0
5	6.0	2	2	2	1	8.0	0
5	6.0	2	2	2	1	9.0	0
5	6.0	2	2	2	1	10	0

A	B	C	D	E	F	G	H
5	6.0	2	2	2	2	6.0	0
5	6.0	2	2	2	2	7.0	0
5	6.0	2	2	2	2	8.0	0
5	6.0	2	2	2	2	9.0	0
5	6.0	2	2	2	2	10	0
5	6.0	2	2	3	1	6.0	0
5	6.0	2	2	3	1	7.0	0
5	6.0	2	2	3	1	8.0	0
5	6.0	2	2	3	1	9.0	0
5	6.0	2	2	3	1	10	0
5	6.0	2	2	3	2	6.0	0
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5	6.0	2	2	3	2	8.0	0
5	6.0	2	2	3	2	9.0	0
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5	6.0	3	1	1	1	7.0	0
5	6.0	3	1	1	1	8.0	0
5	6.0	3	1	1	1	9.0	0
5	6.0	3	1	1	1	10	0
5	6.0	3	1	1	2	6.0	0
5	6.0	3	1	1	2	7.0	0
5	6.0	3	1	1	2	8.0	0
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5	6.0	3	1	1	2	10	0
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5	6.0	3	1	2	1	9.0	0
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5	6.0	3	1	2	2	9.0	0
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5	6.0	3	1	3	1	6.0	0
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5	6.0	3	1	3	1	8.0	0
5	6.0	3	1	3	1	9.0	0
5	6.0	3	1	3	1	10	0
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5	6.0	3	1	3	2	7.0	0
5	6.0	3	1	3	2	8.0	0
5	6.0	3	1	3	2	9.0	0
5	6.0	3	1	3	2	10	0
5	6.0	3	2	1	1	6.0	0
5	6.0	3	2	1	1	7.0	0
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5	6.0	3	2	1	1	9.0	0
5	6.0	3	2	1	1	10	0
5	6.0	3	2	1	2	6.0	0
5	6.0	3	2	1	2	7.0	0
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5	6.0	3	2	1	2	9.0	0
5	6.0	3	2	1	2	10	0
5	6.0	3	2	2	1	6.0	0
5	6.0	3	2	2	1	7.0	0
5	6.0	3	2	2	1	8.0	0
5	6.0	3	2	2	1	9.0	0
5	6.0	3	2	2	1	10	0
5	6.0	3	2	2	2	6.0	0
5	6.0	3	2	2	2	7.0	0
5	6.0	3	2	2	2	8.0	0
5	6.0	3	2	2	2	9.0	0
5	6.0	3	2	2	2	10	0
5	6.0	3	2	3	1	6.0	0

A	B	C	D	E	F	G	H
5	6.0	3	2	3	1	7.0	0
5	6.0	3	2	3	1	8.0	0
5	6.0	3	2	3	1	9.0	0
5	6.0	3	2	3	1	10	0
5	6.0	3	2	3	2	6.0	0
5	6.0	3	2	3	2	7.0	0
5	6.0	3	2	3	2	8.0	0
5	6.0	3	2	3	2	9.0	0
5	6.0	3	2	3	2	10	0
5	6.0	4	1	1	1	6.0	0
5	6.0	4	1	1	1	7.0	0
5	6.0	4	1	1	1	8.0	0
5	6.0	4	1	1	1	9.0	0
5	6.0	4	1	1	1	10	0
5	6.0	4	1	1	2	6.0	0
5	6.0	4	1	1	2	7.0	0
5	6.0	4	1	1	2	8.0	0
5	6.0	4	1	1	2	9.0	0
5	6.0	4	1	1	2	10	0
5	6.0	4	1	2	1	6.0	0
5	6.0	4	1	2	1	7.0	0
5	6.0	4	1	2	1	8.0	0
5	6.0	4	1	2	1	9.0	0
5	6.0	4	1	2	1	10	0
5	6.0	4	1	2	2	6.0	0
5	6.0	4	1	2	2	7.0	0
5	6.0	4	1	2	2	8.0	0
5	6.0	4	1	2	2	9.0	0
5	6.0	4	1	2	2	10	0
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5	6.0	4	1	3	1	7.0	0
5	6.0	4	1	3	1	8.0	0
5	6.0	4	1	3	1	9.0	0
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5	6.0	4	1	3	2	9.0	0
5	6.0	4	1	3	2	10	0
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5	6.0	4	2	1	1	7.0	0
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5	6.0	4	2	1	1	9.0	0
5	6.0	4	2	1	1	10	0
5	6.0	4	2	1	2	6.0	0
5	6.0	4	2	1	2	7.0	0
5	6.0	4	2	1	2	8.0	0
5	6.0	4	2	1	2	9.0	0
5	6.0	4	2	1	2	10	0
5	6.0	4	2	2	1	6.0	0
5	6.0	4	2	2	1	7.0	0
5	6.0	4	2	2	1	8.0	0
5	6.0	4	2	2	1	9.0	0
5	6.0	4	2	2	1	10	0
5	6.0	4	2	2	2	6.0	0
5	6.0	4	2	2	2	7.0	0
5	6.0	4	2	2	2	8.0	0
5	6.0	4	2	2	2	9.0	0
5	6.0	4	2	2	2	10	0
5	6.0	4	2	3	1	6.0	0
5	6.0	4	2	3	1	7.0	0
5	6.0	4	2	3	1	8.0	0
5	6.0	4	2	3	1	9.0	0
5	6.0	4	2	3	1	10	0
5	6.0	4	2	3	2	6.0	0
5	6.0	4	2	3	2	7.0	0

A	B	C	D	E	F	G	H
5	6.0	4	2	3	2	8.0	0
5	6.0	4	2	3	2	9.0	0
5	6.0	4	2	3	2	10	0
5	6.0	5	1	1	1	6.0	0
5	6.0	5	1	1	1	7.0	0
5	6.0	5	1	1	1	8.0	0
5	6.0	5	1	1	1	9.0	0
5	6.0	5	1	1	1	10	0
5	6.0	5	1	1	2	6.0	0
5	6.0	5	1	1	2	7.0	0
5	6.0	5	1	1	2	8.0	0
5	6.0	5	1	1	2	9.0	0
5	6.0	5	1	1	2	10	0
5	6.0	5	1	2	1	6.0	0
5	6.0	5	1	2	1	7.0	0
5	6.0	5	1	2	1	8.0	0
5	6.0	5	1	2	1	9.0	0
5	6.0	5	1	2	1	10	0
5	6.0	5	1	2	2	6.0	0
5	6.0	5	1	2	2	7.0	0
5	6.0	5	1	2	2	8.0	0
5	6.0	5	1	2	2	9.0	0
5	6.0	5	1	2	2	10	0
5	6.0	5	1	3	1	6.0	0
5	6.0	5	1	3	1	7.0	0
5	6.0	5	1	3	1	8.0	0
5	6.0	5	1	3	1	9.0	0
5	6.0	5	1	3	1	10	0
5	6.0	5	1	3	2	6.0	1
5	6.0	5	1	3	2	7.0	1
5	6.0	5	1	3	2	8.0	1
5	6.0	5	1	3	2	9.0	1
5	6.0	5	1	3	2	10	1
5	6.0	5	2	1	1	6.0	0
5	6.0	5	2	1	1	7.0	0
5	6.0	5	2	1	1	8.0	0
5	6.0	5	2	1	1	9.0	0
5	6.0	5	2	1	1	10	0
5	6.0	5	2	1	2	6.0	0
5	6.0	5	2	1	2	7.0	0
5	6.0	5	2	1	2	8.0	0
5	6.0	5	2	1	2	9.0	0
5	6.0	5	2	1	2	10	0
5	6.0	5	2	2	1	6.0	0
5	6.0	5	2	2	1	7.0	0
5	6.0	5	2	2	1	8.0	0
5	6.0	5	2	2	1	9.0	0
5	6.0	5	2	2	1	10	0
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5	6.0	5	2	2	2	7.0	0
5	6.0	5	2	2	2	8.0	0
5	6.0	5	2	2	2	9.0	0
5	6.0	5	2	2	2	10	0
5	6.0	5	2	3	1	6.0	0
5	6.0	5	2	3	1	7.0	0
5	6.0	5	2	3	1	8.0	0
5	6.0	5	2	3	1	9.0	0
5	6.0	5	2	3	1	10	0
5	6.0	5	2	3	2	6.0	0
5	6.0	5	2	3	2	7.0	0
5	6.0	5	2	3	2	8.0	0
5	6.0	5	2	3	2	9.0	0
5	6.0	5	2	3	2	10	0
5	7.0	1	1	1	1	7.0	0
5	7.0	1	1	1	1	8.0	0
5	7.0	1	1	1	1	9.0	0

A	B	C	D	E	F	G	H
5	7.0	1	1	1	1	10	0
5	7.0	1	1	1	2	7.0	0
5	7.0	1	1	1	2	8.0	0
5	7.0	1	1	1	2	9.0	0
5	7.0	1	1	1	2	10	0
5	7.0	1	1	2	1	7.0	0
5	7.0	1	1	2	1	8.0	0
5	7.0	1	1	2	1	9.0	0
5	7.0	1	1	2	1	10	0
5	7.0	1	1	2	2	7.0	0
5	7.0	1	1	2	2	8.0	0
5	7.0	1	1	2	2	9.0	0
5	7.0	1	1	2	2	10	0
5	7.0	1	1	3	1	7.0	0
5	7.0	1	1	3	1	8.0	0
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5	7.0	1	1	3	1	10	0
5	7.0	1	1	3	2	7.0	0
5	7.0	1	1	3	2	8.0	0
5	7.0	1	1	3	2	9.0	0
5	7.0	1	1	3	2	10	0
5	7.0	1	2	1	1	7.0	0
5	7.0	1	2	1	1	8.0	0
5	7.0	1	2	1	1	9.0	0
5	7.0	1	2	1	1	10	0
5	7.0	1	2	1	2	7.0	0
5	7.0	1	2	1	2	8.0	0
5	7.0	1	2	1	2	9.0	0
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5	7.0	1	2	2	1	8.0	0
5	7.0	1	2	2	1	9.0	0
5	7.0	1	2	2	1	10	0
5	7.0	1	2	2	2	7.0	0
5	7.0	1	2	2	2	8.0	0
5	7.0	1	2	2	2	9.0	0
5	7.0	1	2	2	2	10	0
5	7.0	1	2	3	1	7.0	0
5	7.0	1	2	3	1	8.0	0
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5	7.0	1	2	3	1	10	0
5	7.0	1	2	3	2	7.0	0
5	7.0	1	2	3	2	8.0	0
5	7.0	1	2	3	2	9.0	0
5	7.0	1	2	3	2	10	0
5	7.0	2	1	1	1	7.0	0
5	7.0	2	1	1	1	8.0	0
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5	7.0	2	1	1	2	7.0	0
5	7.0	2	1	1	2	8.0	0
5	7.0	2	1	1	2	9.0	0
5	7.0	2	1	1	2	10	0
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5	7.0	2	1	2	1	8.0	0
5	7.0	2	1	2	1	9.0	0
5	7.0	2	1	2	1	10	0
5	7.0	2	1	2	2	7.0	0
5	7.0	2	1	2	2	8.0	0
5	7.0	2	1	2	2	9.0	0
5	7.0	2	1	2	2	10	0
5	7.0	2	1	3	1	7.0	0
5	7.0	2	1	3	1	8.0	0
5	7.0	2	1	3	1	9.0	0
5	7.0	2	1	3	1	10	0
5	7.0	2	1	3	2	7.0	0

A	B	C	D	E	F	G	H
5	7.0	2	1	3	2	8.0	0
5	7.0	2	1	3	2	9.0	0
5	7.0	2	1	3	2	10	0
5	7.0	2	2	1	1	7.0	0
5	7.0	2	2	1	1	8.0	0
5	7.0	2	2	1	1	9.0	0
5	7.0	2	2	1	1	10	0
5	7.0	2	2	1	2	7.0	0
5	7.0	2	2	1	2	8.0	0
5	7.0	2	2	1	2	9.0	0
5	7.0	2	2	1	2	10	0
5	7.0	2	2	2	1	7.0	0
5	7.0	2	2	2	1	8.0	0
5	7.0	2	2	2	1	9.0	0
5	7.0	2	2	2	1	10	0
5	7.0	2	2	2	2	7.0	0
5	7.0	2	2	2	2	8.0	0
5	7.0	2	2	2	2	9.0	0
5	7.0	2	2	2	2	10	0
5	7.0	2	2	3	1	7.0	0
5	7.0	2	2	3	1	8.0	0
5	7.0	2	2	3	1	9.0	0
5	7.0	2	2	3	1	10	0
5	7.0	2	2	3	2	7.0	0
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5	7.0	2	2	3	2	9.0	0
5	7.0	2	2	3	2	10	0
5	7.0	3	1	1	1	7.0	0
5	7.0	3	1	1	1	8.0	0
5	7.0	3	1	1	1	9.0	0
5	7.0	3	1	1	1	10	0
5	7.0	3	1	1	2	7.0	0
5	7.0	3	1	1	2	8.0	0
5	7.0	3	1	1	2	9.0	0
5	7.0	3	1	1	2	10	0
5	7.0	3	1	2	1	7.0	0
5	7.0	3	1	2	1	8.0	0
5	7.0	3	1	2	1	9.0	0
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5	7.0	3	2	3	2	7.0	0
5	7.0	3	2	3	2	8.0	0
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5	7.0	4	2	2	1	9.0	0
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5	7.0	4	2	2	2	10	0
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5	7.0	4	2	3	2	10	0
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5	7.0	5	1	1	1	9.0	0
5	7.0	5	1	1	1	10	0
5	7.0	5	1	1	2	7.0	0
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5	7.0	5	1	2	1	8.0	0
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5	7.0	5	1	2	2	7.0	0
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5	7.0	5	1	2	2	9.0	0
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5	7.0	5	1	3	2	10	0
5	7.0	5	2	1	1	7.0	0
5	7.0	5	2	1	1	8.0	0
5	7.0	5	2	1	1	9.0	0
5	7.0	5	2	1	1	10	0
5	7.0	5	2	1	2	7.0	0
5	7.0	5	2	1	2	8.0	0
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5	8.0	1	1	1	1	8.0	0
5	8.0	1	1	1	1	9.0	0
5	8.0	1	1	1	1	10	0
5	8.0	1	1	1	2	8.0	1
5	8.0	1	1	1	2	9.0	1
5	8.0	1	1	1	2	10	1
5	8.0	1	1	2	1	8.0	0
5	8.0	1	1	2	1	9.0	0
5	8.0	1	1	2	1	10	0
5	8.0	1	1	2	2	8.0	0
5	8.0	1	1	2	2	9.0	0
5	8.0	1	1	2	2	10	0
5	8.0	1	1	3	1	8.0	1
5	8.0	1	1	3	1	9.0	1
5	8.0	1	1	3	1	10	1
5	8.0	1	1	3	2	8.0	1
5	8.0	1	1	3	2	9.0	1
5	8.0	1	1	3	2	10	1
5	8.0	1	2	1	1	8.0	0
5	8.0	1	2	1	1	9.0	0
5	8.0	1	2	1	1	10	0
5	8.0	1	2	1	2	8.0	0
5	8.0	1	2	1	2	9.0	0
5	8.0	1	2	1	2	10	0
5	8.0	1	2	2	1	8.0	0
5	8.0	1	2	2	1	9.0	0
5	8.0	1	2	2	1	10	0

A	B	C	D	E	F	G	H
5	8.0	1	2	2	2	8.0	0
5	8.0	1	2	2	2	9.0	0
5	8.0	1	2	2	2	10	0
5	8.0	1	2	3	1	8.0	0
5	8.0	1	2	3	1	9.0	0
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5	8.0	2	1	2	2	10	0
5	8.0	2	1	3	1	8.0	0
5	8.0	2	1	3	1	9.0	0
5	8.0	2	1	3	1	10	0
5	8.0	2	1	3	2	8.0	1
5	8.0	2	1	3	2	9.0	1
5	8.0	2	1	3	2	10	1
5	8.0	2	2	1	1	8.0	0
5	8.0	2	2	1	1	9.0	0
5	8.0	2	2	1	1	10	0
5	8.0	2	2	1	2	8.0	0
5	8.0	2	2	1	2	9.0	0
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5	8.0	2	2	2	1	10	0
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5	8.0	3	1	1	1	9.0	1
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5	8.0	3	1	2	1	9.0	0
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5	8.0	3	1	3	1	9.0	0
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5	8.0	3	1	3	2	9.0	3
5	8.0	3	1	3	2	10	1
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5	8.0	3	2	1	2	9.0	0
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5	8.0	3	2	3	1	9.0	0
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5	8.0	3	2	3	2	10	0
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5	8.0	5	1	3	1	10	0
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5	8.0	5	2	3	1	10	0
5	8.0	5	2	3	2	8.0	1
5	8.0	5	2	3	2	9.0	1
5	8.0	5	2	3	2	10	0
5	9.0	1	1	1	1	9.0	30
5	9.0	1	1	1	1	9.5	24
5	9.0	1	1	1	1	10	10
5	9.0	1	1	1	2	9.0	32
5	9.0	1	1	1	2	9.5	32
5	9.0	1	1	1	2	10	23
5	9.0	1	1	2	1	9.0	25
5	9.0	1	1	2	1	9.5	23
5	9.0	1	1	2	1	10	19
5	9.0	1	1	2	2	9.0	18
5	9.0	1	1	2	2	9.5	17
5	9.0	1	1	2	2	10	11
5	9.0	1	1	3	1	9.0	10
5	9.0	1	1	3	1	9.5	8
5	9.0	1	1	3	1	10	5
5	9.0	1	1	3	2	9.0	20
5	9.0	1	1	3	2	9.5	17
5	9.0	1	1	3	2	10	9
5	9.0	1	2	1	1	9.0	5
5	9.0	1	2	1	1	9.5	5
5	9.0	1	2	1	1	10	1
5	9.0	1	2	1	2	9.0	16
5	9.0	1	2	1	2	9.5	15
5	9.0	1	2	1	2	10	6
5	9.0	1	2	2	1	9.0	15
5	9.0	1	2	2	1	9.5	15
5	9.0	1	2	2	1	10	1
5	9.0	1	2	2	2	9.0	19
5	9.0	1	2	2	2	9.5	19
5	9.0	1	2	2	2	10	12
5	9.0	1	2	3	1	9.0	10
5	9.0	1	2	3	1	9.5	10
5	9.0	1	2	3	1	10	9
5	9.0	1	2	3	2	9.0	12
5	9.0	1	2	3	2	9.5	8
5	9.0	1	2	3	2	10	6
5	9.0	2	1	1	1	9.0	27
5	9.0	2	1	1	1	9.5	27
5	9.0	2	1	1	1	10	17
5	9.0	2	1	1	2	9.0	26
5	9.0	2	1	1	2	9.5	23
5	9.0	2	1	1	2	10	21
5	9.0	2	1	2	1	9.0	37
5	9.0	2	1	2	1	9.5	34
5	9.0	2	1	2	1	10	27

A	B	C	D	E	F	G	H
5	9.0	2	1	2	2	9.0	32
5	9.0	2	1	2	2	9.5	30
5	9.0	2	1	2	2	10	23
5	9.0	2	1	3	1	9.0	19
5	9.0	2	1	3	1	9.5	17
5	9.0	2	1	3	1	10	17
5	9.0	2	1	3	2	9.0	21
5	9.0	2	1	3	2	9.5	19
5	9.0	2	1	3	2	10	18
5	9.0	2	2	1	1	9.0	10
5	9.0	2	2	1	1	9.5	10
5	9.0	2	2	1	1	10	6
5	9.0	2	2	1	2	9.0	11
5	9.0	2	2	1	2	9.5	11
5	9.0	2	2	1	2	10	9
5	9.0	2	2	2	1	9.0	9
5	9.0	2	2	2	1	9.5	9
5	9.0	2	2	2	1	10	3
5	9.0	2	2	2	2	9.0	14
5	9.0	2	2	2	2	9.5	13
5	9.0	2	2	2	2	10	12
5	9.0	2	2	3	1	9.0	14
5	9.0	2	2	3	1	9.5	12
5	9.0	2	2	3	1	10	7
5	9.0	2	2	3	2	9.0	22
5	9.0	2	2	3	2	9.5	22
5	9.0	2	2	3	2	10	15
5	9.0	3	1	1	1	9.0	31
5	9.0	3	1	1	1	9.5	30
5	9.0	3	1	1	1	10	26
5	9.0	3	1	1	2	9.0	40
5	9.0	3	1	1	2	9.5	38
5	9.0	3	1	1	2	10	31
5	9.0	3	1	2	1	9.0	19
5	9.0	3	1	2	1	9.5	15
5	9.0	3	1	2	1	10	10
5	9.0	3	1	2	2	9.0	30
5	9.0	3	1	2	2	9.5	27
5	9.0	3	1	2	2	10	21
5	9.0	3	1	3	1	9.0	29
5	9.0	3	1	3	1	9.5	28
5	9.0	3	1	3	1	10	22
5	9.0	3	1	3	2	9.0	25
5	9.0	3	1	3	2	9.5	20
5	9.0	3	1	3	2	10	18
5	9.0	3	2	1	1	9.0	12
5	9.0	3	2	1	1	9.5	12
5	9.0	3	2	1	1	10	8
5	9.0	3	2	1	2	9.0	10
5	9.0	3	2	1	2	9.5	9
5	9.0	3	2	1	2	10	3
5	9.0	3	2	2	1	9.0	16
5	9.0	3	2	2	1	9.5	11
5	9.0	3	2	2	1	10	8
5	9.0	3	2	2	2	9.0	13
5	9.0	3	2	2	2	9.5	13
5	9.0	3	2	2	2	10	11
5	9.0	3	2	3	1	9.0	23
5	9.0	3	2	3	1	9.5	22
5	9.0	3	2	3	1	10	16
5	9.0	3	2	3	2	9.0	19
5	9.0	3	2	3	2	9.5	19
5	9.0	3	2	3	2	10	14
5	9.0	4	1	1	1	9.0	37
5	9.0	4	1	1	1	9.5	37
5	9.0	4	1	1	1	10	30

A	B	C	D	E	F	G	H
5	9.0	4	1	1	2	9.0	31
5	9.0	4	1	1	2	9.5	31
5	9.0	4	1	1	2	10	26
5	9.0	4	1	2	1	9.0	34
5	9.0	4	1	2	1	9.5	32
5	9.0	4	1	2	1	10	29
5	9.0	4	1	2	2	9.0	29
5	9.0	4	1	2	2	9.5	29
5	9.0	4	1	2	2	10	19
5	9.0	4	1	3	1	9.0	36
5	9.0	4	1	3	1	9.5	33
5	9.0	4	1	3	1	10	20
5	9.0	4	1	3	2	9.0	30
5	9.0	4	1	3	2	9.5	27
5	9.0	4	1	3	2	10	20
5	9.0	4	2	1	1	9.0	22
5	9.0	4	2	1	1	9.5	22
5	9.0	4	2	1	1	10	14
5	9.0	4	2	1	2	9.0	21
5	9.0	4	2	1	2	9.5	18
5	9.0	4	2	1	2	10	3
5	9.0	4	2	2	1	9.0	15
5	9.0	4	2	2	1	9.5	14
5	9.0	4	2	2	1	10	8
5	9.0	4	2	2	2	9.0	13
5	9.0	4	2	2	2	9.5	11
5	9.0	4	2	2	2	10	5
5	9.0	4	2	3	1	9.0	26
5	9.0	4	2	3	1	9.5	21
5	9.0	4	2	3	1	10	13
5	9.0	4	2	3	2	9.0	28
5	9.0	4	2	3	2	9.5	26
5	9.0	4	2	3	2	10	11
5	9.0	5	1	1	1	9.0	40
5	9.0	5	1	1	1	9.5	32
5	9.0	5	1	1	1	10	26
5	9.0	5	1	1	2	9.0	34
5	9.0	5	1	1	2	9.5	30
5	9.0	5	1	1	2	10	23
5	9.0	5	1	2	1	9.0	41
5	9.0	5	1	2	1	9.5	40
5	9.0	5	1	2	1	10	38
5	9.0	5	1	2	2	9.0	31
5	9.0	5	1	2	2	9.5	29
5	9.0	5	1	2	2	10	25
5	9.0	5	1	3	1	9.0	44
5	9.0	5	1	3	1	9.5	42
5	9.0	5	1	3	1	10	42
5	9.0	5	1	3	2	9.0	40
5	9.0	5	1	3	2	9.5	35
5	9.0	5	1	3	2	10	29
5	9.0	5	2	1	1	9.0	33
5	9.0	5	2	1	1	9.5	29
5	9.0	5	2	1	1	10	20
5	9.0	5	2	1	2	9.0	34
5	9.0	5	2	1	2	9.5	25
5	9.0	5	2	1	2	10	17
5	9.0	5	2	2	1	9.0	23
5	9.0	5	2	2	1	9.5	18
5	9.0	5	2	2	1	10	10
5	9.0	5	2	2	2	9.0	31
5	9.0	5	2	2	2	9.5	25
5	9.0	5	2	2	2	10	19
5	9.0	5	2	3	1	9.0	25
5	9.0	5	2	3	1	9.5	23
5	9.0	5	2	3	1	10	18

A	B	C	D	E	F	G	H
5	9.0	5	2	3	2	9.0	17
5	9.0	5	2	3	2	9.5	16
5	9.0	5	2	3	2	10	7
5	9.5	1	1	1	1	9.5	1
5	9.5	1	1	1	1	10	0
5	9.5	1	1	1	2	9.5	0
5	9.5	1	1	1	2	10	0
5	9.5	1	1	2	1	9.5	1
5	9.5	1	1	2	1	10	1
5	9.5	1	1	2	2	9.5	1
5	9.5	1	1	2	2	10	0
5	9.5	1	1	3	1	9.5	2
5	9.5	1	1	3	1	10	2
5	9.5	1	1	3	2	9.5	1
5	9.5	1	1	3	2	10	1
5	9.5	1	2	1	1	9.5	2
5	9.5	1	2	1	1	10	2
5	9.5	1	2	1	2	9.5	3
5	9.5	1	2	1	2	10	0
5	9.5	1	2	2	1	9.5	0
5	9.5	1	2	2	1	10	0
5	9.5	1	2	2	2	9.5	5
5	9.5	1	2	2	2	10	1
5	9.5	1	2	3	1	9.5	2
5	9.5	1	2	3	1	10	1
5	9.5	1	2	3	2	9.5	1
5	9.5	1	2	3	2	10	0
5	9.5	2	1	1	1	9.5	0
5	9.5	2	1	1	1	10	0
5	9.5	2	1	1	2	9.5	0
5	9.5	2	1	1	2	10	0
5	9.5	2	1	2	1	9.5	0
5	9.5	2	1	2	1	10	0
5	9.5	2	1	2	2	9.5	0
5	9.5	2	1	2	2	10	0
5	9.5	2	1	3	1	9.5	1
5	9.5	2	1	3	1	10	1
5	9.5	2	1	3	2	9.5	0
5	9.5	2	1	3	2	10	0
5	9.5	2	2	1	1	9.5	0
5	9.5	2	2	1	1	10	0
5	9.5	2	2	1	2	9.5	1
5	9.5	2	2	1	2	10	0
5	9.5	2	2	2	1	9.5	0
5	9.5	2	2	2	1	10	0
5	9.5	2	2	2	2	9.5	0
5	9.5	2	2	2	2	10	0
5	9.5	2	2	3	1	9.5	0
5	9.5	2	2	3	1	10	0
5	9.5	2	2	3	2	9.5	0
5	9.5	2	2	3	2	10	0
5	9.5	3	1	1	1	9.5	0
5	9.5	3	1	1	1	10	0
5	9.5	3	1	1	2	9.5	0
5	9.5	3	1	1	2	10	0
5	9.5	3	1	2	1	9.5	0
5	9.5	3	1	2	1	10	0
5	9.5	3	1	2	2	9.5	1
5	9.5	3	1	2	2	10	0
5	9.5	3	1	3	1	9.5	0
5	9.5	3	1	3	1	10	0
5	9.5	3	1	3	2	9.5	0
5	9.5	3	1	3	2	10	0
5	9.5	3	2	1	1	9.5	2
5	9.5	3	2	1	1	10	1
5	9.5	3	2	1	2	9.5	4

A	B	C	D	E	F	G	H
5	9.5	3	2	1	2	10	2
5	9.5	3	2	2	1	9.5	0
5	9.5	3	2	2	1	10	0
5	9.5	3	2	2	2	9.5	0
5	9.5	3	2	2	2	10	0
5	9.5	3	2	3	1	9.5	0
5	9.5	3	2	3	1	10	0
5	9.5	3	2	3	2	9.5	1
5	9.5	3	2	3	2	10	1
5	9.5	4	1	1	1	9.5	2
5	9.5	4	1	1	1	10	1
5	9.5	4	1	1	2	9.5	6
5	9.5	4	1	1	2	10	2
5	9.5	4	1	2	1	9.5	2
5	9.5	4	1	2	1	10	2
5	9.5	4	1	2	2	9.5	2
5	9.5	4	1	2	2	10	1
5	9.5	4	1	3	1	9.5	0
5	9.5	4	1	3	1	10	0
5	9.5	4	1	3	2	9.5	1
5	9.5	4	1	3	2	10	1
5	9.5	4	2	1	1	9.5	2
5	9.5	4	2	1	1	10	1
5	9.5	4	2	1	2	9.5	1
5	9.5	4	2	1	2	10	1
5	9.5	4	2	2	1	9.5	0
5	9.5	4	2	2	1	10	0
5	9.5	4	2	2	2	9.5	0
5	9.5	4	2	2	2	10	0
5	9.5	4	2	3	1	9.5	1
5	9.5	4	2	3	1	10	0
5	9.5	4	2	3	2	9.5	1
5	9.5	4	2	3	2	10	0
5	9.5	5	1	1	1	9.5	2
5	9.5	5	1	1	1	10	2
5	9.5	5	1	1	2	9.5	0
5	9.5	5	1	1	2	10	0
5	9.5	5	1	2	1	9.5	1
5	9.5	5	1	2	1	10	1
5	9.5	5	1	2	2	9.5	0
5	9.5	5	1	2	2	10	0
5	9.5	5	1	3	1	9.5	0
5	9.5	5	1	3	1	10	0
5	9.5	5	1	3	2	9.5	0
5	9.5	5	1	3	2	10	0
5	9.5	5	2	1	1	9.5	0
5	9.5	5	2	1	1	10	0
5	9.5	5	2	1	2	9.5	0
5	9.5	5	2	1	2	10	0
5	9.5	5	2	2	1	9.5	0
5	9.5	5	2	2	1	10	0
5	9.5	5	2	2	2	9.5	1
5	9.5	5	2	2	2	10	0
5	9.5	5	2	3	1	9.5	1
5	9.5	5	2	3	1	10	0
5	9.5	5	2	3	2	9.5	0
5	9.5	5	2	3	2	10	0
5	10	1	1	1	1	10	0
5	10	1	1	1	2	10	0
5	10	1	1	2	1	10	0
5	10	1	1	2	2	10	0
5	10	1	1	3	1	10	0
5	10	1	1	3	2	10	0
5	10	1	2	1	1	10	0
5	10	1	2	1	2	10	1
5	10	1	2	2	1	10	1
5	10	1	2	2	2	10	0
5	10	1	2	3	1	10	0
5	10	1	2	3	2	10	0
5	10	2	1	1	1	10	1
5	10	2	1	1	2	10	0
5	10	2	1	2	1	10	0
5	10	2	1	2	2	10	0
5	10	2	1	3	1	10	0
5	10	2	1	3	2	10	0
5	10	2	2	1	1	10	0
5	10	2	2	1	2	10	0
5	10	2	2	2	1	10	1
5	10	2	2	2	2	10	0
5	10	2	2	3	1	10	0
5	10	2	2	3	2	10	0
5	10	3	1	1	1	10	0
5	10	3	1	1	2	10	0
5	10	3	1	2	1	10	0
5	10	3	1	2	2	10	0
5	10	3	1	3	1	10	0
5	10	3	1	3	2	10	0
5	10	3	2	1	1	10	0
5	10	3	2	1	2	10	0
5	10	3	2	2	1	10	0
5	10	3	2	2	2	10	1
5	10	3	2	3	1	10	0
5	10	3	2	3	2	10	1
5	10	4	1	1	1	10	0
5	10	4	1	1	2	10	0
5	10	4	1	2	1	10	0
5	10	4	1	2	2	10	0
5	10	4	1	3	1	10	0
5	10	4	1	3	2	10	1
5	10	4	2	1	1	10	0
5	10	4	2	1	2	10	0
5	10	4	2	2	1	10	0
5	10	4	2	2	2	10	0
5	10	4	2	3	1	10	0
5	10	4	2	3	2	10	0
5	10	5	1	1	1	10	0
5	10	5	1	1	2	10	0
5	10	5	1	2	1	10	1
5	10	5	1	2	2	10	0
5	10	5	1	3	1	10	0
5	10	5	1	3	2	10	1
5	10	5	2	1	1	10	2
5	10	5	2	1	2	10	0
5	10	5	2	2	1	10	0
5	10	5	2	2	2	10	0
5	10	5	2	3	1	10	0
5	10	5	2	3	2	10	0

Appendix 6 - Table 1

A - Species:
- 1 - *Agropyron dasystachyum*
- 2 - *Agropyron trachycaulum*
- 3 - *Bromus inermis*
- 4 - *Festuca hallii*
- 5 - *Stipa comata*
- 6 - *Stipa curtiseta*
- 7 - *Stipa viridula*
- 8 - *Stipa viridula* (Lodorm)

B - Cohort number

C - Site along topographic gradient (A=ridge, E=toe of slope)

D - Moisture treatment:
- 1 - Control
- 2 - Irrigated

E - Plot (replicate)

F - Subplot (duplicate)

G - Count number:
- 1 - June 5, 1989
- 2 - June 13, 1989
- 3 - June 26, 1989
- 4 - July 4, 1989
- 5 - July 18, 1989
- 6 - July 26, 1989
- 7 - August 10, 1989
- 8 - August 19, 1989 (Survivorship)
- 8 - September 3, 1989 (Germination)
- 9 - May 17, 1990
- 9.5 - May 29, 1990
- 10 - July 26, 1990

H - Germination and subsequent survivorship

Table 1.6. Individual germination and survivorship data for *Stipa curtiseta* from field experiment in 1989 and 1990.

A	B	C	D	E	F	G	H
6	1	1	1	1	1	1	14
6	1	1	1	1	1	2	14
6	1	1	1	1	1	3	14
6	1	1	1	1	1	4	14
6	1	1	1	1	1	5	14
6	1	1	1	1	1	6	14
6	1	1	1	1	1	7	14
6	1	1	1	1	1	8	14
6	1	1	1	1	1	9	14
6	1	1	1	1	1	10	14
6	1	1	1	1	2	1	4
6	1	1	1	1	2	2	4
6	1	1	1	1	2	3	4
6	1	1	1	1	2	4	4
6	1	1	1	1	2	5	4
6	1	1	1	1	2	6	4
6	1	1	1	1	2	7	4
6	1	1	1	1	2	8	4
6	1	1	1	1	2	9	4
6	1	1	1	1	2	10	4
6	1	1	1	2	1	1	3
6	1	1	1	2	1	2	3
6	1	1	1	2	1	3	3
6	1	1	1	2	1	4	3
6	1	1	1	2	1	5	3
6	1	1	1	2	1	6	3
6	1	1	1	2	1	7	3
6	1	1	1	2	1	8	3
6	1	1	1	2	1	9	3
6	1	1	1	2	1	10	3
6	1	1	1	2	2	1	7
6	1	1	1	2	2	2	7
6	1	1	1	2	2	3	7
6	1	1	1	2	2	4	7
6	1	1	1	2	2	5	7
6	1	1	1	2	2	6	7
6	1	1	1	2	2	7	7
6	1	1	1	2	2	8	7
6	1	1	1	2	2	9	7
6	1	1	1	2	2	10	7
6	1	1	1	3	1	1	12
6	1	1	1	3	1	2	12
6	1	1	1	3	1	3	12
6	1	1	1	3	1	4	12
6	1	1	1	3	1	5	12
6	1	1	1	3	1	6	12
6	1	1	1	3	1	7	12
6	1	1	1	3	1	8	12
6	1	1	1	3	1	9	12
6	1	1	1	3	1	10	12
6	1	1	1	3	2	1	6
6	1	1	1	3	2	2	6
6	1	1	1	3	2	3	6
6	1	1	1	3	2	4	6
6	1	1	1	3	2	5	6
6	1	1	1	3	2	6	6
6	1	1	1	3	2	7	6
6	1	1	1	3	2	8	6
6	1	1	1	3	2	9	6
6	1	1	1	3	2	10	6
6	1	1	2	1	1	1	24
6	1	1	2	1	1	2	24
6	1	1	2	1	1	3	24
6	1	1	2	1	1	4	24
6	1	1	2	1	1	5	23
6	1	1	2	1	1	6	23
6	1	1	2	1	1	7	23
6	1	1	2	1	1	8	23
6	1	1	2	1	1	9	23
6	1	1	2	1	1	10	23
6	1	1	2	1	2	1	10
6	1	1	2	1	2	2	10
6	1	1	2	1	2	3	10
6	1	1	2	1	2	4	10
6	1	1	2	1	2	5	10
6	1	1	2	1	2	6	10
6	1	1	2	1	2	7	10
6	1	1	2	1	2	8	10
6	1	1	2	1	2	9	10
6	1	1	2	1	2	10	10
6	1	1	2	2	1	1	16
6	1	1	2	2	1	2	16
6	1	1	2	2	1	3	16
6	1	1	2	2	1	4	16
6	1	1	2	2	1	5	16
6	1	1	2	2	1	6	16
6	1	1	2	2	1	7	16
6	1	1	2	2	1	8	16
6	1	1	2	2	1	9	
6	1	1	2	2	1	10	16
6	1	1	2	2	2	1	22
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A	B	C	D	E	F	G	H
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A	B	C	D	E	F	G	H
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A	B	C	D	E	F	G	H
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A	B	C	D	E	F	G	H
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A	B	C	D	E	F	G	H
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6	9.5	4	2	3	1	9.5	1
6	9.5	4	2	3	1	10	1
6	9.5	4	2	3	2	9.5	0
6	9.5	4	2	3	2	10	0
6	9.5	5	1	1	1	9.5	1
6	9.5	5	1	1	1	10	1
6	9.5	5	1	1	2	9.5	1
6	9.5	5	1	1	2	10	1
6	9.5	5	1	2	1	9.5	0
6	9.5	5	1	2	1	10	0
6	9.5	5	1	2	2	9.5	0
6	9.5	5	1	2	2	10	0
6	9.5	5	1	3	1	9.5	0
6	9.5	5	1	3	1	10	0
6	9.5	5	1	3	2	9.5	0
6	9.5	5	1	3	2	10	0
6	9.5	5	2	1	1	9.5	0
6	9.5	5	2	1	1	10	0
6	9.5	5	2	1	2	9.5	0
6	9.5	5	2	1	2	10	0
6	9.5	5	2	2	1	9.5	0
6	9.5	5	2	2	1	10	0
6	9.5	5	2	2	2	9.5	0
6	9.5	5	2	2	2	10	0
6	9.5	5	2	3	1	9.5	0
6	9.5	5	2	3	1	10	0
6	9.5	5	2	3	2	9.5	0
6	9.5	5	2	3	2	10	0
6	10	1	1	1	1	10	0
6	10	1	1	1	2	10	0
6	10	1	1	2	1	10	0
6	10	1	1	2	2	10	0
6	10	1	1	3	1	10	0
6	10	1	1	3	2	10	0
6	10	1	2	1	1	10	0
6	10	1	2	1	2	10	1
6	10	1	2	2	1	10	0

A	B	C	D	E	F	G	H
6	10	1	2	2	2	10	0
6	10	1	2	3	1	10	0
6	10	1	2	3	2	10	0
6	10	2	1	1	1	10	0
6	10	2	1	1	2	10	0
6	10	2	1	2	1	10	0
6	10	2	1	2	2	10	0
6	10	2	1	3	1	10	0
6	10	2	1	3	2	10	0
6	10	2	2	1	1	10	0
6	10	2	2	1	2	10	0
6	10	2	2	2	1	10	0
6	10	2	2	2	2	10	1
6	10	2	2	3	1	10	0
6	10	2	2	3	2	10	0
6	10	3	1	1	1	10	0
6	10	3	1	1	2	10	1
6	10	3	1	2	1	10	0
6	10	3	1	2	2	10	0
6	10	3	1	3	1	10	0
6	10	3	1	3	2	10	0
6	10	3	2	1	1	10	0
6	10	3	2	1	2	10	0
6	10	3	2	2	1	10	0
6	10	3	2	2	2	10	0
6	10	3	2	3	1	10	0
6	10	3	2	3	2	10	0
6	10	4	1	1	1	10	0
6	10	4	1	1	2	10	0
6	10	4	1	2	1	10	0
6	10	4	1	2	2	10	0
6	10	4	1	3	1	10	0
6	10	4	1	3	2	10	0
6	10	4	2	1	1	10	0
6	10	4	2	1	2	10	0
6	10	4	2	2	1	10	0
6	10	4	2	2	2	10	0
6	10	4	2	3	1	10	0
6	10	4	2	3	2	10	1
6	10	5	1	1	1	10	0
6	10	5	1	1	2	10	0
6	10	5	1	2	1	10	0
6	10	5	1	2	2	10	0
6	10	5	1	3	1	10	0
6	10	5	1	3	2	10	0
6	10	5	2	1	1	10	0
6	10	5	2	1	2	10	0
6	10	5	2	2	1	10	0
6	10	5	2	2	2	10	0
6	10	5	2	3	1	10	0
6	10	5	2	3	2	10	0

Appendix 6 - Table 1

A - Species:
- 1 - *Agropyron dasystachyum*
- 2 - *Agropyron trachycaulum*
- 3 - *Bromus inermis*
- 4 - *Festuca hallii*
- 5 - *Stipa comata*
- 6 - *Stipa curtiseta*
- 7 - *Stipa viridula*
- 8 - *Stipa viridula* (Lodorm)

B - Cohort number

C - Site along topographic gradient (A=ridge, E=toe of slope)

D - Moisture treatment:
- 1 - Control
- 2 - Irrigated

E - Plot (replicate)

F - Subplot (duplicate)

G - Count number:
- 1 - June 5, 1989
- 2 - June 13, 1989
- 3 - June 26, 1989
- 4 - July 4, 1989
- 5 - July 18, 1989
- 6 - July 26, 1989
- 7 - August 10, 1989
- 8 - August 19, 1989 (Survivorship)
- 8 - September 3, 1989 (Germination)
- 9 - May 17, 1990
- 9.5 - May 29, 1990
- 10 - July 26, 1990

H - Germination and subsequent survivorship

Table 1.7. Individual germination and survivorship data for *Stipa viridula* from field experiment in 1989 and 1990.

A	B	C	D	E	F	G	H
7	1.0	1	1	1	1	1.0	1
7	1.0	1	1	1	1	2.0	1
7	1.0	1	1	1	1	3.0	1
7	1.0	1	1	1	1	4.0	1
7	1.0	1	1	1	1	5.0	1
7	1.0	1	1	1	1	6.0	1
7	1.0	1	1	1	1	7.0	1
7	1.0	1	1	1	1	8.0	1
7	1.0	1	1	1	1	9.0	1
7	1.0	1	1	1	1	10	1
7	1.0	1	1	1	2	1.0	1
7	1.0	1	1	1	2	2.0	1
7	1.0	1	1	1	2	3.0	1
7	1.0	1	1	1	2	4.0	1
7	1.0	1	1	1	2	5.0	1
7	1.0	1	1	1	2	6.0	1
7	1.0	1	1	1	2	7.0	1
7	1.0	1	1	1	2	8.0	1
7	1.0	1	1	1	2	9.0	1
7	1.0	1	1	1	2	10	1
7	1.0	1	1	2	1	1.0	0
7	1.0	1	1	2	1	2.0	0
7	1.0	1	1	2	1	3.0	0
7	1.0	1	1	2	1	4.0	0
7	1.0	1	1	2	1	5.0	0
7	1.0	1	1	2	1	6.0	0
7	1.0	1	1	2	1	7.0	0
7	1.0	1	1	2	1	8.0	0
7	1.0	1	1	2	1	9.0	0
7	1.0	1	1	2	1	10	0
7	1.0	1	1	2	2	1.0	0
7	1.0	1	1	2	2	2.0	0
7	1.0	1	1	2	2	3.0	0
7	1.0	1	1	2	2	4.0	0
7	1.0	1	1	2	2	5.0	0
7	1.0	1	1	2	2	6.0	0
7	1.0	1	1	2	2	7.0	0
7	1.0	1	1	2	2	8.0	0
7	1.0	1	1	2	2	9.0	0
7	1.0	1	1	2	2	10	0
7	1.0	1	1	3	1	1.0	2
7	1.0	1	1	3	1	2.0	2
7	1.0	1	1	3	1	3.0	2
7	1.0	1	1	3	1	4.0	2
7	1.0	1	1	3	1	5.0	2
7	1.0	1	1	3	1	6.0	2
7	1.0	1	1	3	1	7.0	2
7	1.0	1	1	3	1	8.0	2
7	1.0	1	1	3	1	9.0	2
7	1.0	1	1	3	1	10	2
7	1.0	1	1	3	2	1.0	0
7	1.0	1	1	3	2	2.0	0
7	1.0	1	1	3	2	3.0	0
7	1.0	1	1	3	2	4.0	0
7	1.0	1	1	3	2	5.0	0
7	1.0	1	1	3	2	6.0	0
7	1.0	1	1	3	2	7.0	0
7	1.0	1	1	3	2	8.0	0
7	1.0	1	1	3	2	9.0	0
7	1.0	1	1	3	2	10	0
7	1.0	1	2	1	1	1.0	2
7	1.0	1	2	1	1	2.0	2
7	1.0	1	2	1	1	3.0	2
7	1.0	1	2	1	1	4.0	2
7	1.0	1	2	1	1	5.0	2
7	1.0	1	2	1	1	6.0	2
7	1.0	1	2	1	1	7.0	2
7	1.0	1	2	1	1	8.0	2
7	1.0	1	2	1	1	9.0	2
7	1.0	1	2	1	1	10	2
7	1.0	1	2	1	2	1.0	0
7	1.0	1	2	1	2	2.0	0
7	1.0	1	2	1	2	3.0	0
7	1.0	1	2	1	2	4.0	0
7	1.0	1	2	1	2	5.0	0
7	1.0	1	2	1	2	6.0	0
7	1.0	1	2	1	2	7.0	0
7	1.0	1	2	1	2	8.0	0
7	1.0	1	2	1	2	9.0	0
7	1.0	1	2	1	2	10	0
7	1.0	1	2	2	1	1.0	0
7	1.0	1	2	2	1	2.0	0
7	1.0	1	2	2	1	3.0	0
7	1.0	1	2	2	1	4.0	0
7	1.0	1	2	2	1	5.0	0
7	1.0	1	2	2	1	6.0	0
7	1.0	1	2	2	1	7.0	0
7	1.0	1	2	2	1	8.0	0
7	1.0	1	2	2	1	9.0	0
7	1.0	1	2	2	1	10	0
7	1.0	1	2	2	2	1.0	0
7	1.0	1	2	2	2	2.0	0
7	1.0	1	2	2	2	3.0	0
7	1.0	1	2	2	2	4.0	0
7	1.0	1	2	2	2	5.0	0
7	1.0	1	2	2	2	6.0	0
7	1.0	1	2	2	2	7.0	0
7	1.0	1	2	2	2	8.0	0
7	1.0	1	2	2	2	9.0	0
7	1.0	1	2	2	2	10	0
7	1.0	1	2	3	1	1.0	2
7	1.0	1	2	3	1	2.0	2
7	1.0	1	2	3	1	3.0	2
7	1.0	1	2	3	1	4.0	2
7	1.0	1	2	3	1	5.0	2
7	1.0	1	2	3	1	6.0	2
7	1.0	1	2	3	1	7.0	2
7	1.0	1	2	3	1	8.0	2
7	1.0	1	2	3	1	9.0	2
7	1.0	1	2	3	1	10	2
7	1.0	1	2	3	2	1.0	0
7	1.0	1	2	3	2	2.0	0
7	1.0	1	2	3	2	3.0	0
7	1.0	1	2	3	2	4.0	0
7	1.0	1	2	3	2	5.0	0
7	1.0	1	2	3	2	6.0	0
7	1.0	1	2	3	2	7.0	0
7	1.0	1	2	3	2	8.0	0
7	1.0	1	2	3	2	9.0	0
7	1.0	1	2	3	2	10	0
7	1.0	2	1	1	1	1.0	0
7	1.0	2	1	1	1	2.0	0
7	1.0	2	1	1	1	3.0	0
7	1.0	2	1	1	1	4.0	0
7	1.0	2	1	1	1	5.0	0
7	1.0	2	1	1	1	6.0	0
7	1.0	2	1	1	1	7.0	0
7	1.0	2	1	1	1	8.0	0
7	1.0	2	1	1	1	9.0	0
7	1.0	2	1	1	1	10	0
7	1.0	2	1	1	2	1.0	0
7	1.0	2	1	1	2	2.0	0
7	1.0	2	1	1	2	3.0	0
7	1.0	2	1	1	2	4.0	0
7	1.0	2	1	1	2	5.0	0
7	1.0	2	1	1	2	6.0	0
7	1.0	2	1	1	2	7.0	0
7	1.0	2	1	1	2	8.0	0
7	1.0	2	1	1	2	9.0	0
7	1.0	2	1	1	2	10	0
7	1.0	2	1	2	1	1.0	0
7	1.0	2	1	2	1	2.0	0
7	1.0	2	1	2	1	3.0	0
7	1.0	2	1	2	1	4.0	0
7	1.0	2	1	2	1	5.0	0
7	1.0	2	1	2	1	6.0	0
7	1.0	2	1	2	1	7.0	0
7	1.0	2	1	2	1	8.0	0
7	1.0	2	1	2	1	9.0	0
7	1.0	2	1	2	1	10	0
7	1.0	2	1	2	2	1.0	1
7	1.0	2	1	2	2	2.0	1
7	1.0	2	1	2	2	3.0	1
7	1.0	2	1	2	2	4.0	1
7	1.0	2	1	2	2	5.0	1
7	1.0	2	1	2	2	6.0	1
7	1.0	2	1	2	2	7.0	1
7	1.0	2	1	2	2	8.0	1
7	1.0	2	1	2	2	9.0	1
7	1.0	2	1	2	2	10	1
7	1.0	2	1	3	1	1.0	1
7	1.0	2	1	3	1	2.0	1
7	1.0	2	1	3	1	3.0	1
7	1.0	2	1	3	1	4.0	1
7	1.0	2	1	3	1	5.0	1
7	1.0	2	1	3	1	6.0	1
7	1.0	2	1	3	1	7.0	1
7	1.0	2	1	3	1	8.0	1
7	1.0	2	1	3	1	9.0	1
7	1.0	2	1	3	1	10	1
7	1.0	2	1	3	2	1.0	1
7	1.0	2	1	3	2	2.0	1
7	1.0	2	1	3	2	3.0	1
7	1.0	2	1	3	2	4.0	1
7	1.0	2	1	3	2	5.0	1
7	1.0	2	1	3	2	6.0	1
7	1.0	2	1	3	2	7.0	1
7	1.0	2	1	3	2	8.0	1
7	1.0	2	1	3	2	9.0	1
7	1.0	2	1	3	2	10	1
7	1.0	2	2	1	1	1.0	0
7	1.0	2	2	1	1	2.0	0
7	1.0	2	2	1	1	3.0	0
7	1.0	2	2	1	1	4.0	0
7	1.0	2	2	1	1	5.0	0
7	1.0	2	2	1	1	6.0	0
7	1.0	2	2	1	1	7.0	0
7	1.0	2	2	1	1	8.0	0
7	1.0	2	2	1	1	9.0	0
7	1.0	2	2	1	1	10	0
7	1.0	2	2	1	2	1.0	0
7	1.0	2	2	1	2	2.0	0
7	1.0	2	2	1	2	3.0	0
7	1.0	2	2	1	2	4.0	0
7	1.0	2	2	1	2	5.0	0

A	B	C	D	E	F	G	H
7	1.0	2	2	1	2	6.0	0
7	1.0	2	2	1	2	7.0	0
7	1.0	2	2	1	2	8.0	0
7	1.0	2	2	1	2	9.0	0
7	1.0	2	2	1	2	10	0
7	1.0	2	2	2	1	1.0	1
7	1.0	2	2	2	1	2.0	1
7	1.0	2	2	2	1	3.0	1
7	1.0	2	2	2	1	4.0	1
7	1.0	2	2	2	1	5.0	1
7	1.0	2	2	2	1	6.0	1
7	1.0	2	2	2	1	7.0	1
7	1.0	2	2	2	1	8.0	1
7	1.0	2	2	2	1	9.0	1
7	1.0	2	2	2	1	10	1
7	1.0	2	2	2	2	1.0	0
7	1.0	2	2	2	2	2.0	0
7	1.0	2	2	2	2	3.0	0
7	1.0	2	2	2	2	4.0	0
7	1.0	2	2	2	2	5.0	0
7	1.0	2	2	2	2	6.0	0
7	1.0	2	2	2	2	7.0	0
7	1.0	2	2	2	2	8.0	0
7	1.0	2	2	2	2	9.0	0
7	1.0	2	2	2	2	10	0
7	1.0	2	2	3	1	1.0	1
7	1.0	2	2	3	1	2.0	1
7	1.0	2	2	3	1	3.0	1
7	1.0	2	2	3	1	4.0	1
7	1.0	2	2	3	1	5.0	1
7	1.0	2	2	3	1	6.0	1
7	1.0	2	2	3	1	7.0	1
7	1.0	2	2	3	1	8.0	1
7	1.0	2	2	3	1	9.0	1
7	1.0	2	2	3	1	10	1
7	1.0	2	2	3	2	1.0	0
7	1.0	2	2	3	2	2.0	0
7	1.0	2	2	3	2	3.0	0
7	1.0	2	2	3	2	4.0	0
7	1.0	2	2	3	2	5.0	0
7	1.0	2	2	3	2	6.0	0
7	1.0	2	2	3	2	7.0	0
7	1.0	2	2	3	2	8.0	0
7	1.0	2	2	3	2	9.0	0
7	1.0	2	2	3	2	10	0
7	1.0	3	1	1	1	1.0	0
7	1.0	3	1	1	1	2.0	0
7	1.0	3	1	1	1	3.0	0
7	1.0	3	1	1	1	4.0	0
7	1.0	3	1	1	1	5.0	0
7	1.0	3	1	1	1	6.0	0
7	1.0	3	1	1	1	7.0	0
7	1.0	3	1	1	1	8.0	0
7	1.0	3	1	1	1	9.0	0
7	1.0	3	1	1	1	10	0
7	1.0	3	1	1	2	1.0	2
7	1.0	3	1	1	2	2.0	2
7	1.0	3	1	1	2	3.0	2
7	1.0	3	1	1	2	4.0	2
7	1.0	3	1	1	2	5.0	2
7	1.0	3	1	1	2	6.0	2
7	1.0	3	1	1	2	7.0	2
7	1.0	3	1	1	2	8.0	2
7	1.0	3	1	1	2	9.0	2
7	1.0	3	1	1	2	10	2
7	1.0	3	1	2	1	1.0	1
7	1.0	3	1	2	1	2.0	1
7	1.0	3	1	2	1	3.0	1
7	1.0	3	1	2	1	4.0	1
7	1.0	3	1	2	1	5.0	1
7	1.0	3	1	2	1	6.0	1
7	1.0	3	1	2	1	7.0	1
7	1.0	3	1	2	1	8.0	1
7	1.0	3	1	2	1	9.0	1
7	1.0	3	1	2	1	10	1
7	1.0	3	1	2	2	1.0	0
7	1.0	3	1	2	2	2.0	0
7	1.0	3	1	2	2	3.0	0
7	1.0	3	1	2	2	4.0	0
7	1.0	3	1	2	2	5.0	0
7	1.0	3	1	2	2	6.0	0
7	1.0	3	1	2	2	7.0	0
7	1.0	3	1	2	2	8.0	0
7	1.0	3	1	2	2	9.0	0
7	1.0	3	1	2	2	10	0
7	1.0	3	1	3	1	1.0	0
7	1.0	3	1	3	1	2.0	0
7	1.0	3	1	3	1	3.0	0
7	1.0	3	1	3	1	4.0	0
7	1.0	3	1	3	1	5.0	0
7	1.0	3	1	3	1	6.0	0
7	1.0	3	1	3	1	7.0	0
7	1.0	3	1	3	1	8.0	0
7	1.0	3	1	3	1	9.0	0
7	1.0	3	1	3	1	10	0
7	1.0	3	1	3	2	1.0	0
7	1.0	3	1	3	2	2.0	0
7	1.0	3	1	3	2	3.0	0
7	1.0	3	1	3	2	4.0	0
7	1.0	3	1	3	2	5.0	0
7	1.0	3	1	3	2	6.0	0
7	1.0	3	1	3	2	7.0	0
7	1.0	3	1	3	2	8.0	0
7	1.0	3	1	3	2	9.0	0
7	1.0	3	1	3	2	10	0
7	1.0	3	2	1	1	1.0	2
7	1.0	3	2	1	1	2.0	2
7	1.0	3	2	1	1	3.0	2
7	1.0	3	2	1	1	4.0	2
7	1.0	3	2	1	1	5.0	2
7	1.0	3	2	1	1	6.0	2
7	1.0	3	2	1	1	7.0	2
7	1.0	3	2	1	1	8.0	2
7	1.0	3	2	1	1	9.0	2
7	1.0	3	2	1	1	10	2
7	1.0	3	2	1	2	1.0	1
7	1.0	3	2	1	2	2.0	1
7	1.0	3	2	1	2	3.0	1
7	1.0	3	2	1	2	4.0	1
7	1.0	3	2	1	2	5.0	1
7	1.0	3	2	1	2	6.0	1
7	1.0	3	2	1	2	7.0	1
7	1.0	3	2	1	2	8.0	1
7	1.0	3	2	1	2	9.0	1
7	1.0	3	2	1	2	10	1
7	1.0	3	2	2	1	1.0	1
7	1.0	3	2	2	1	2.0	1
7	1.0	3	2	2	1	3.0	1
7	1.0	3	2	2	1	4.0	1
7	1.0	3	2	2	1	5.0	1
7	1.0	3	2	2	1	6.0	1
7	1.0	3	2	2	1	7.0	1
7	1.0	3	2	2	1	8.0	1
7	1.0	3	2	2	1	9.0	1
7	1.0	3	2	2	1	10	1
7	1.0	3	2	2	2	1.0	1
7	1.0	3	2	2	2	2.0	1
7	1.0	3	2	2	2	3.0	1
7	1.0	3	2	2	2	4.0	1
7	1.0	3	2	2	2	5.0	1
7	1.0	3	2	2	2	6.0	1
7	1.0	3	2	2	2	7.0	1
7	1.0	3	2	2	2	8.0	1
7	1.0	3	2	2	2	9.0	1
7	1.0	3	2	2	2	10	1
7	1.0	3	2	3	1	1.0	0
7	1.0	3	2	3	1	2.0	0
7	1.0	3	2	3	1	3.0	0
7	1.0	3	2	3	1	4.0	0
7	1.0	3	2	3	1	5.0	0
7	1.0	3	2	3	1	6.0	0
7	1.0	3	2	3	1	7.0	0
7	1.0	3	2	3	1	8.0	0
7	1.0	3	2	3	1	9.0	0
7	1.0	3	2	3	1	10	0
7	1.0	3	2	3	2	1.0	0
7	1.0	3	2	3	2	2.0	0
7	1.0	3	2	3	2	3.0	0
7	1.0	3	2	3	2	4.0	0
7	1.0	3	2	3	2	5.0	0
7	1.0	3	2	3	2	6.0	0
7	1.0	3	2	3	2	7.0	0
7	1.0	3	2	3	2	8.0	0
7	1.0	3	2	3	2	9.0	0
7	1.0	3	2	3	2	10	0
7	1.0	4	1	1	1	1.0	0
7	1.0	4	1	1	1	2.0	0
7	1.0	4	1	1	1	3.0	0
7	1.0	4	1	1	1	4.0	0
7	1.0	4	1	1	1	5.0	0
7	1.0	4	1	1	1	6.0	0
7	1.0	4	1	1	1	7.0	0
7	1.0	4	1	1	1	8.0	0
7	1.0	4	1	1	1	9.0	0
7	1.0	4	1	1	1	10	0
7	1.0	4	1	1	2	1.0	0
7	1.0	4	1	1	2	2.0	0
7	1.0	4	1	1	2	3.0	0
7	1.0	4	1	1	2	4.0	0
7	1.0	4	1	1	2	5.0	0
7	1.0	4	1	1	2	6.0	0
7	1.0	4	1	1	2	7.0	0
7	1.0	4	1	1	2	8.0	0
7	1.0	4	1	1	2	9.0	0
7	1.0	4	1	1	2	10	0
7	1.0	4	1	2	1	1.0	0
7	1.0	4	1	2	1	2.0	0
7	1.0	4	1	2	1	3.0	0
7	1.0	4	1	2	1	4.0	0
7	1.0	4	1	2	1	5.0	0
7	1.0	4	1	2	1	6.0	0
7	1.0	4	1	2	1	7.0	0
7	1.0	4	1	2	1	8.0	0
7	1.0	4	1	2	1	9.0	0
7	1.0	4	1	2	1	10	0
7	1.0	4	1	2	2	1.0	0
7	1.0	4	1	2	2	2.0	0
7	1.0	4	1	2	2	3.0	0

A	B	C	D	E	F	G	H
7	1.0	4	1	2	2	4.0	0
7	1.0	4	1	2	2	5.0	0
7	1.0	4	1	2	2	6.0	0
7	1.0	4	1	2	2	7.0	0
7	1.0	4	1	2	2	8.0	0
7	1.0	4	1	2	2	9.0	0
7	1.0	4	1	2	2	10	0
7	1.0	4	1	3	1	1.0	0
7	1.0	4	1	3	1	2.0	0
7	1.0	4	1	3	1	3.0	0
7	1.0	4	1	3	1	4.0	0
7	1.0	4	1	3	1	5.0	0
7	1.0	4	1	3	1	6.0	0
7	1.0	4	1	3	1	7.0	0
7	1.0	4	1	3	1	8.0	0
7	1.0	4	1	3	1	9.0	0
7	1.0	4	1	3	1	10	0
7	1.0	4	1	3	2	1.0	0
7	1.0	4	1	3	2	2.0	0
7	1.0	4	1	3	2	3.0	0
7	1.0	4	1	3	2	4.0	0
7	1.0	4	1	3	2	5.0	0
7	1.0	4	1	3	2	6.0	0
7	1.0	4	1	3	2	7.0	0
7	1.0	4	1	3	2	8.0	0
7	1.0	4	1	3	2	9.0	0
7	1.0	4	1	3	2	10	0
7	1.0	4	2	1	1	1.0	0
7	1.0	4	2	1	1	2.0	0
7	1.0	4	2	1	1	3.0	0
7	1.0	4	2	1	1	4.0	0
7	1.0	4	2	1	1	5.0	0
7	1.0	4	2	1	1	6.0	0
7	1.0	4	2	1	1	7.0	0
7	1.0	4	2	1	1	8.0	0
7	1.0	4	2	1	1	9.0	0
7	1.0	4	2	1	1	10	0
7	1.0	4	2	1	2	1.0	0
7	1.0	4	2	1	2	2.0	0
7	1.0	4	2	1	2	3.0	0
7	1.0	4	2	1	2	4.0	0
7	1.0	4	2	1	2	5.0	0
7	1.0	4	2	1	2	6.0	0
7	1.0	4	2	1	2	7.0	0
7	1.0	4	2	1	2	8.0	0
7	1.0	4	2	1	2	9.0	0
7	1.0	4	2	1	2	10	0
7	1.0	4	2	2	1	1.0	0
7	1.0	4	2	2	1	2.0	0
7	1.0	4	2	2	1	3.0	0
7	1.0	4	2	2	1	4.0	0
7	1.0	4	2	2	1	5.0	0
7	1.0	4	2	2	1	6.0	0
7	1.0	4	2	2	1	7.0	0
7	1.0	4	2	2	1	8.0	0
7	1.0	4	2	2	1	9.0	0
7	1.0	4	2	2	1	10	0
7	1.0	4	2	2	2	1.0	0
7	1.0	4	2	2	2	2.0	0
7	1.0	4	2	2	2	3.0	0
7	1.0	4	2	2	2	4.0	0
7	1.0	4	2	2	2	5.0	0
7	1.0	4	2	2	2	6.0	0
7	1.0	4	2	2	2	7.0	0
7	1.0	4	2	2	2	8.0	0
7	1.0	4	2	2	2	9.0	0

A	B	C	D	E	F	G	H
7	1.0	4	2	2	2	10	0
7	1.0	4	2	3	1	1.0	1
7	1.0	4	2	3	1	2.0	1
7	1.0	4	2	3	1	3.0	1
7	1.0	4	2	3	1	4.0	1
7	1.0	4	2	3	1	5.0	1
7	1.0	4	2	3	1	6.0	1
7	1.0	4	2	3	1	7.0	1
7	1.0	4	2	3	1	8.0	1
7	1.0	4	2	3	1	9.0	1
7	1.0	4	2	3	1	10	1
7	1.0	4	2	3	2	1.0	0
7	1.0	4	2	3	2	2.0	0
7	1.0	4	2	3	2	3.0	0
7	1.0	4	2	3	2	4.0	0
7	1.0	4	2	3	2	5.0	0
7	1.0	4	2	3	2	6.0	0
7	1.0	4	2	3	2	7.0	0
7	1.0	4	2	3	2	8.0	0
7	1.0	4	2	3	2	9.0	0
7	1.0	4	2	3	2	10	0
7	1.0	5	1	1	1	1.0	0
7	1.0	5	1	1	1	2.0	0
7	1.0	5	1	1	1	3.0	0
7	1.0	5	1	1	1	4.0	0
7	1.0	5	1	1	1	5.0	0
7	1.0	5	1	1	1	6.0	0
7	1.0	5	1	1	1	7.0	0
7	1.0	5	1	1	1	8.0	0
7	1.0	5	1	1	1	9.0	0
7	1.0	5	1	1	1	10	0
7	1.0	5	1	1	2	1.0	0
7	1.0	5	1	1	2	2.0	0
7	1.0	5	1	1	2	3.0	0
7	1.0	5	1	1	2	4.0	0
7	1.0	5	1	1	2	5.0	0
7	1.0	5	1	1	2	6.0	0
7	1.0	5	1	1	2	7.0	0
7	1.0	5	1	1	2	8.0	0
7	1.0	5	1	1	2	9.0	0
7	1.0	5	1	1	2	10	0
7	1.0	5	1	2	1	1.0	0
7	1.0	5	1	2	1	2.0	0
7	1.0	5	1	2	1	3.0	0
7	1.0	5	1	2	1	4.0	0
7	1.0	5	1	2	1	5.0	0
7	1.0	5	1	2	1	6.0	0
7	1.0	5	1	2	1	7.0	0
7	1.0	5	1	2	1	8.0	0
7	1.0	5	1	2	1	9.0	0
7	1.0	5	1	2	1	10	0
7	1.0	5	1	2	2	1.0	0
7	1.0	5	1	2	2	2.0	0
7	1.0	5	1	2	2	3.0	0
7	1.0	5	1	2	2	4.0	0
7	1.0	5	1	2	2	5.0	0
7	1.0	5	1	2	2	6.0	0
7	1.0	5	1	2	2	7.0	0
7	1.0	5	1	2	2	8.0	0
7	1.0	5	1	2	2	9.0	0
7	1.0	5	1	2	2	10	0
7	1.0	5	1	3	1	1.0	0
7	1.0	5	1	3	1	2.0	0
7	1.0	5	1	3	1	3.0	0
7	1.0	5	1	3	1	4.0	0
7	1.0	5	1	3	1	5.0	0

A	B	C	D	E	F	G	H
7	1.0	5	1	3	1	6.0	0
7	1.0	5	1	3	1	7.0	0
7	1.0	5	1	3	1	8.0	0
7	1.0	5	1	3	1	9.0	0
7	1.0	5	1	3	1	10	0
7	1.0	5	1	3	2	1.0	1
7	1.0	5	1	3	2	2.0	1
7	1.0	5	1	3	2	3.0	0
7	1.0	5	1	3	2	4.0	0
7	1.0	5	1	3	2	5.0	0
7	1.0	5	1	3	2	6.0	0
7	1.0	5	1	3	2	7.0	0
7	1.0	5	1	3	2	8.0	0
7	1.0	5	1	3	2	9.0	0
7	1.0	5	1	3	2	10	0
7	1.0	5	2	1	1	1.0	1
7	1.0	5	2	1	1	2.0	1
7	1.0	5	2	1	1	3.0	1
7	1.0	5	2	1	1	4.0	1
7	1.0	5	2	1	1	5.0	1
7	1.0	5	2	1	1	6.0	1
7	1.0	5	2	1	1	7.0	1
7	1.0	5	2	1	1	8.0	1
7	1.0	5	2	1	1	9.0	1
7	1.0	5	2	1	1	10	1
7	1.0	5	2	1	2	1.0	1
7	1.0	5	2	1	2	2.0	1
7	1.0	5	2	1	2	3.0	1
7	1.0	5	2	1	2	4.0	1
7	1.0	5	2	1	2	5.0	1
7	1.0	5	2	1	2	6.0	1
7	1.0	5	2	1	2	7.0	1
7	1.0	5	2	1	2	8.0	1
7	1.0	5	2	1	2	9.0	1
7	1.0	5	2	1	2	10	1
7	1.0	5	2	2	1	1.0	5
7	1.0	5	2	2	1	2.0	5
7	1.0	5	2	2	1	3.0	5
7	1.0	5	2	2	1	4.0	5
7	1.0	5	2	2	1	5.0	4
7	1.0	5	2	2	1	6.0	4
7	1.0	5	2	2	1	7.0	4
7	1.0	5	2	2	1	8.0	4
7	1.0	5	2	2	1	9.0	.
7	1.0	5	2	2	1	10	4
7	1.0	5	2	2	2	1.0	0
7	1.0	5	2	2	2	2.0	0
7	1.0	5	2	2	2	3.0	0
7	1.0	5	2	2	2	4.0	0
7	1.0	5	2	2	2	5.0	0
7	1.0	5	2	2	2	6.0	0
7	1.0	5	2	2	2	7.0	0
7	1.0	5	2	2	2	8.0	0
7	1.0	5	2	2	2	9.0	0
7	1.0	5	2	2	2	10	0
7	1.0	5	2	3	1	1.0	1
7	1.0	5	2	3	1	2.0	1
7	1.0	5	2	3	1	3.0	1
7	1.0	5	2	3	1	4.0	1
7	1.0	5	2	3	1	5.0	1
7	1.0	5	2	3	1	6.0	1
7	1.0	5	2	3	1	7.0	1
7	1.0	5	2	3	1	8.0	1
7	1.0	5	2	3	1	9.0	1
7	1.0	5	2	3	1	10	1
7	1.0	5	2	3	2	1.0	0

A	B	C	D	E	F	G	H
7	1.0	5	2	3	2	2.0	0
7	1.0	5	2	3	2	3.0	0
7	1.0	5	2	3	2	4.0	0
7	1.0	5	2	3	2	5.0	0
7	1.0	5	2	3	2	6.0	0
7	1.0	5	2	3	2	7.0	0
7	1.0	5	2	3	2	8.0	0
7	1.0	5	2	3	2	9.0	0
7	1.0	5	2	3	2	10	0
7	2.0	1	1	1	1	2.0	0
7	2.0	1	1	1	1	3.0	0
7	2.0	1	1	1	1	4.0	0
7	2.0	1	1	1	1	5.0	0
7	2.0	1	1	1	1	6.0	0
7	2.0	1	1	1	1	7.0	0
7	2.0	1	1	1	1	8.0	0
7	2.0	1	1	1	1	9.0	0
7	2.0	1	1	1	1	10	0
7	2.0	1	1	1	2	2.0	0
7	2.0	1	1	1	2	3.0	0
7	2.0	1	1	1	2	4.0	0
7	2.0	1	1	1	2	5.0	0
7	2.0	1	1	1	2	6.0	0
7	2.0	1	1	1	2	7.0	0
7	2.0	1	1	1	2	8.0	0
7	2.0	1	1	1	2	9.0	0
7	2.0	1	1	1	2	10	0
7	2.0	1	1	2	1	2.0	0
7	2.0	1	1	2	1	3.0	0
7	2.0	1	1	2	1	4.0	0
7	2.0	1	1	2	1	5.0	0
7	2.0	1	1	2	1	6.0	0
7	2.0	1	1	2	1	7.0	0
7	2.0	1	1	2	1	8.0	0
7	2.0	1	1	2	1	9.0	0
7	2.0	1	1	2	1	10	0
7	2.0	1	1	2	2	2.0	0
7	2.0	1	1	2	2	3.0	0
7	2.0	1	1	2	2	4.0	0
7	2.0	1	1	2	2	5.0	0
7	2.0	1	1	2	2	6.0	0
7	2.0	1	1	2	2	7.0	0
7	2.0	1	1	2	2	8.0	0
7	2.0	1	1	2	2	9.0	0
7	2.0	1	1	2	2	10	0
7	2.0	1	1	3	1	2.0	1
7	2.0	1	1	3	1	3.0	1
7	2.0	1	1	3	1	4.0	1
7	2.0	1	1	3	1	5.0	1
7	2.0	1	1	3	1	6.0	1
7	2.0	1	1	3	1	7.0	1
7	2.0	1	1	3	1	8.0	1
7	2.0	1	1	3	1	9.0	1
7	2.0	1	1	3	1	10	1
7	2.0	1	1	3	2	2.0	0
7	2.0	1	1	3	2	3.0	0
7	2.0	1	1	3	2	4.0	0
7	2.0	1	1	3	2	5.0	0
7	2.0	1	1	3	2	6.0	0
7	2.0	1	1	3	2	7.0	0
7	2.0	1	1	3	2	8.0	0
7	2.0	1	1	3	2	9.0	0
7	2.0	1	1	3	2	10	0
7	2.0	1	2	1	1	2.0	0
7	2.0	1	2	1	1	3.0	0
7	2.0	1	2	1	1	4.0	0
7	2.0	1	2	1	1	5.0	0
7	2.0	1	2	1	1	6.0	0
7	2.0	1	2	1	1	7.0	0
7	2.0	1	2	1	1	8.0	0
7	2.0	1	2	1	1	9.0	0
7	2.0	1	2	1	1	10	0
7	2.0	1	2	1	2	2.0	1
7	2.0	1	2	1	2	3.0	1
7	2.0	1	2	1	2	4.0	1
7	2.0	1	2	1	2	5.0	1
7	2.0	1	2	1	2	6.0	1
7	2.0	1	2	1	2	7.0	1
7	2.0	1	2	1	2	8.0	1
7	2.0	1	2	1	2	9.0	1
7	2.0	1	2	1	2	10	1
7	2.0	1	2	2	1	2.0	0
7	2.0	1	2	2	1	3.0	0
7	2.0	1	2	2	1	4.0	0
7	2.0	1	2	2	1	5.0	0
7	2.0	1	2	2	1	6.0	0
7	2.0	1	2	2	1	7.0	0
7	2.0	1	2	2	1	8.0	0
7	2.0	1	2	2	1	9.0	0
7	2.0	1	2	2	1	10	0
7	2.0	1	2	2	2	2.0	0
7	2.0	1	2	2	2	3.0	0
7	2.0	1	2	2	2	4.0	0
7	2.0	1	2	2	2	5.0	0
7	2.0	1	2	2	2	6.0	0
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7	2.0	1	2	2	2	8.0	0
7	2.0	1	2	2	2	9.0	0
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7	2.0	1	2	3	1	4.0	0
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7	2.0	1	2	3	1	10	0
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7	2.0	1	2	3	2	3.0	0
7	2.0	1	2	3	2	4.0	0
7	2.0	1	2	3	2	5.0	0
7	2.0	1	2	3	2	6.0	0
7	2.0	1	2	3	2	7.0	0
7	2.0	1	2	3	2	8.0	0
7	2.0	1	2	3	2	9.0	0
7	2.0	1	2	3	2	10	0
7	2.0	2	1	1	1	2.0	0
7	2.0	2	1	1	1	3.0	0
7	2.0	2	1	1	1	4.0	0
7	2.0	2	1	1	1	5.0	0
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7	2.0	2	1	1	1	7.0	0
7	2.0	2	1	1	1	8.0	0
7	2.0	2	1	1	1	9.0	0
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7	2.0	2	1	1	2	3.0	1
7	2.0	2	1	1	2	4.0	1
7	2.0	2	1	1	2	5.0	1
7	2.0	2	1	1	2	6.0	1
7	2.0	2	1	1	2	7.0	1
7	2.0	2	1	1	2	8.0	1
7	2.0	2	1	1	2	9.0	1
7	2.0	2	1	1	2	10	1
7	2.0	2	1	2	1	2.0	0
7	2.0	2	1	2	1	3.0	0
7	2.0	2	1	2	1	4.0	0
7	2.0	2	1	2	1	5.0	0
7	2.0	2	1	2	1	6.0	0
7	2.0	2	1	2	1	7.0	0
7	2.0	2	1	2	1	8.0	0
7	2.0	2	1	2	1	9.0	0
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7	2.0	2	1	2	2	4.0	0
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7	2.0	2	1	3	2	3.0	1
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7	2.0	2	1	3	2	5.0	1
7	2.0	2	1	3	2	6.0	1
7	2.0	2	1	3	2	7.0	1
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7	2.0	2	1	3	2	9.0	1
7	2.0	2	1	3	2	10	1
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7	2.0	2	2	1	1	4.0	0
7	2.0	2	2	1	1	5.0	0
7	2.0	2	2	1	1	6.0	0
7	2.0	2	2	1	1	7.0	0
7	2.0	2	2	1	1	8.0	0
7	2.0	2	2	1	1	9.0	0
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7	2.0	2	2	1	2	3.0	0
7	2.0	2	2	1	2	4.0	0
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7	2.0	2	2	1	2	7.0	0
7	2.0	2	2	1	2	8.0	0
7	2.0	2	2	1	2	9.0	0
7	2.0	2	2	1	2	10	0
7	2.0	2	2	2	1	2.0	0
7	2.0	2	2	2	1	3.0	0
7	2.0	2	2	2	1	4.0	0
7	2.0	2	2	2	1	5.0	0
7	2.0	2	2	2	1	6.0	0
7	2.0	2	2	2	1	7.0	0
7	2.0	2	2	2	1	8.0	0
7	2.0	2	2	2	1	9.0	0
7	2.0	2	2	2	1	10	0

A	B	C	D	E	F	G	H
7	1.0	5	2	3	2	2.0	0
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7	1.0	5	2	3	2	4.0	0
7	1.0	5	2	3	2	5.0	0
7	1.0	5	2	3	2	6.0	0
7	1.0	5	2	3	2	7.0	0
7	1.0	5	2	3	2	8.0	0
7	1.0	5	2	3	2	9.0	0
7	1.0	5	2	3	2	10	0
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7	2.0	1	1	1	1	3.0	0
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7	2.0	1	1	1	2	7.0	0
7	2.0	1	1	1	2	8.0	0
7	2.0	1	1	1	2	9.0	0
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7	2.0	1	1	2	1	9.0	0
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7	2.0	1	1	2	2	3.0	0
7	2.0	1	1	2	2	4.0	0
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7	2.0	1	1	3	1	3.0	1
7	2.0	1	1	3	1	4.0	1
7	2.0	1	1	3	1	5.0	1
7	2.0	1	1	3	1	6.0	1
7	2.0	1	1	3	1	7.0	1
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7	2.0	1	1	3	1	9.0	1
7	2.0	1	1	3	1	10	1
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7	2.0	1	1	3	2	4.0	0
7	2.0	1	1	3	2	5.0	0
7	2.0	1	1	3	2	6.0	0
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7	2.0	1	2	1	1	9.0	0
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7	2.0	1	2	1	2	4.0	1
7	2.0	1	2	1	2	5.0	1
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7	2.0	1	2	1	2	9.0	1
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7	2.0	1	2	2	1	4.0	0
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7	2.0	1	2	2	1	6.0	0
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7	2.0	1	2	2	1	10	0
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7	2.0	1	2	2	2	9.0	0
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7	2.0	1	2	3	1	3.0	0
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7	2.0	1	2	3	1	6.0	0
7	2.0	1	2	3	1	7.0	0
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7	2.0	1	2	3	2	9.0	0
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7	2.0	2	1	1	1	4.0	0
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7	2.0	2	1	1	1	8.0	0
7	2.0	2	1	1	1	9.0	0
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7	2.0	2	1	1	2	4.0	1
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7	2.0	2	1	1	2	7.0	1
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7	2.0	2	1	1	2	9.0	1
7	2.0	2	1	1	2	10	1
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7	2.0	2	1	2	1	4.0	0
7	2.0	2	1	2	1	5.0	0
7	2.0	2	1	2	1	6.0	0
7	2.0	2	1	2	1	7.0	0
7	2.0	2	1	2	1	8.0	0
7	2.0	2	1	2	1	9.0	0
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7	2.0	2	1	2	2	2.0	0
7	2.0	2	1	2	2	3.0	0
7	2.0	2	1	2	2	4.0	0
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7	2.0	2	1	2	2	7.0	0
7	2.0	2	1	2	2	8.0	0
7	2.0	2	1	2	2	9.0	0
7	2.0	2	1	2	2	10	0
7	2.0	2	1	3	1	2.0	1
7	2.0	2	1	3	1	3.0	1
7	2.0	2	1	3	1	4.0	1
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7	2.0	2	1	3	1	7.0	1
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7	2.0	2	1	3	1	9.0	1
7	2.0	2	1	3	1	10	1
7	2.0	2	1	3	2	2.0	1
7	2.0	2	1	3	2	3.0	1
7	2.0	2	1	3	2	4.0	1
7	2.0	2	1	3	2	5.0	1
7	2.0	2	1	3	2	6.0	1
7	2.0	2	1	3	2	7.0	1
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7	2.0	2	1	3	2	9.0	1
7	2.0	2	1	3	2	10	1
7	2.0	2	2	1	1	2.0	0
7	2.0	2	2	1	1	3.0	0
7	2.0	2	2	1	1	4.0	0
7	2.0	2	2	1	1	5.0	0
7	2.0	2	2	1	1	6.0	0
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7	2.0	2	2	1	2	3.0	0
7	2.0	2	2	1	2	4.0	0
7	2.0	2	2	1	2	5.0	0
7	2.0	2	2	1	2	6.0	0
7	2.0	2	2	1	2	7.0	0
7	2.0	2	2	1	2	8.0	0
7	2.0	2	2	1	2	9.0	0
7	2.0	2	2	1	2	10	0
7	2.0	2	2	2	1	2.0	0
7	2.0	2	2	2	1	3.0	0
7	2.0	2	2	2	1	4.0	0
7	2.0	2	2	2	1	5.0	0
7	2.0	2	2	2	1	6.0	0
7	2.0	2	2	2	1	7.0	0
7	2.0	2	2	2	1	8.0	0
7	2.0	2	2	2	1	9.0	0
7	2.0	2	2	2	1	10	0

A	B	C	D	E	F	G	H
7	2.0	2	2	2	2	2.0	0
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7	2.0	2	2	2	2	4.0	0
7	2.0	2	2	2	2	5.0	0
7	2.0	2	2	2	2	6.0	0
7	2.0	2	2	2	2	7.0	0
7	2.0	2	2	2	2	8.0	0
7	2.0	2	2	2	2	9.0	0
7	2.0	2	2	2	2	10	0
7	2.0	2	2	3	1	2.0	0
7	2.0	2	2	3	1	3.0	0
7	2.0	2	2	3	1	4.0	0
7	2.0	2	2	3	1	5.0	0
7	2.0	2	2	3	1	6.0	0
7	2.0	2	2	3	1	7.0	0
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7	2.0	2	2	3	1	10	0
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7	2.0	2	2	3	2	3.0	0
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7	2.0	2	2	3	2	9.0	0
7	2.0	2	2	3	2	10	0
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7	2.0	3	1	1	1	4.0	0
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7	2.0	3	1	1	1	7.0	0
7	2.0	3	1	1	1	8.0	0
7	2.0	3	1	1	1	9.0	0
7	2.0	3	1	1	1	10	0
7	2.0	3	1	1	2	2.0	0
7	2.0	3	1	1	2	3.0	0
7	2.0	3	1	1	2	4.0	0
7	2.0	3	1	1	2	5.0	0
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7	2.0	3	1	1	2	7.0	0
7	2.0	3	1	1	2	8.0	0
7	2.0	3	1	1	2	9.0	0
7	2.0	3	1	1	2	10	0
7	2.0	3	1	2	1	2.0	0
7	2.0	3	1	2	1	3.0	0
7	2.0	3	1	2	1	4.0	0
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7	2.0	3	1	2	1	7.0	0
7	2.0	3	1	2	1	8.0	0
7	2.0	3	1	2	1	9.0	0
7	2.0	3	1	2	1	10	0
7	2.0	3	1	2	2	2.0	0
7	2.0	3	1	2	2	3.0	0
7	2.0	3	1	2	2	4.0	0
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7	2.0	3	1	2	2	10	0
7	2.0	3	1	3	1	2.0	0
7	2.0	3	1	3	1	3.0	0
7	2.0	3	1	3	1	4.0	0

A	B	C	D	E	F	G	H
7	2.0	3	1	3	1	5.0	0
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7	2.0	3	1	3	1	8.0	0
7	2.0	3	1	3	1	9.0	0
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7	2.0	3	1	3	2	6.0	0
7	2.0	3	1	3	2	7.0	0
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7	2.0	3	1	3	2	10	0
7	2.0	3	2	1	1	2.0	1
7	2.0	3	2	1	1	3.0	1
7	2.0	3	2	1	1	4.0	1
7	2.0	3	2	1	1	5.0	1
7	2.0	3	2	1	1	6.0	1
7	2.0	3	2	1	1	7.0	1
7	2.0	3	2	1	1	8.0	1
7	2.0	3	2	1	1	9.0	1
7	2.0	3	2	1	1	10	1
7	2.0	3	2	1	2	2.0	0
7	2.0	3	2	1	2	3.0	0
7	2.0	3	2	1	2	4.0	0
7	2.0	3	2	1	2	5.0	0
7	2.0	3	2	1	2	6.0	0
7	2.0	3	2	1	2	7.0	0
7	2.0	3	2	1	2	8.0	0
7	2.0	3	2	1	2	9.0	0
7	2.0	3	2	1	2	10	0
7	2.0	3	2	2	1	2.0	0
7	2.0	3	2	2	1	3.0	0
7	2.0	3	2	2	1	4.0	0
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7	2.0	3	2	2	1	7.0	0
7	2.0	3	2	2	1	8.0	0
7	2.0	3	2	2	1	9.0	0
7	2.0	3	2	2	1	10	0
7	2.0	3	2	2	2	2.0	0
7	2.0	3	2	2	2	3.0	0
7	2.0	3	2	2	2	4.0	0
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7	2.0	3	2	2	2	7.0	0
7	2.0	3	2	2	2	8.0	0
7	2.0	3	2	2	2	9.0	0
7	2.0	3	2	2	2	10	0
7	2.0	3	2	3	1	2.0	0
7	2.0	3	2	3	1	3.0	0
7	2.0	3	2	3	1	4.0	0
7	2.0	3	2	3	1	5.0	0
7	2.0	3	2	3	1	6.0	0
7	2.0	3	2	3	1	7.0	0
7	2.0	3	2	3	1	8.0	0
7	2.0	3	2	3	1	9.0	0
7	2.0	3	2	3	1	10	0
7	2.0	3	2	3	2	2.0	0
7	2.0	3	2	3	2	3.0	0
7	2.0	3	2	3	2	4.0	0
7	2.0	3	2	3	2	5.0	0
7	2.0	3	2	3	2	6.0	0
7	2.0	3	2	3	2	7.0	0

A	B	C	D	E	F	G	H
7	2.0	3	2	3	2	8.0	0
7	2.0	3	2	3	2	9.0	0
7	2.0	3	2	3	2	10	0
7	2.0	4	1	1	1	2.0	0
7	2.0	4	1	1	1	3.0	0
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7	2.0	4	1	1	1	5.0	0
7	2.0	4	1	1	1	6.0	0
7	2.0	4	1	1	1	7.0	0
7	2.0	4	1	1	1	8.0	0
7	2.0	4	1	1	1	9.0	0
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7	2.0	4	1	1	2	4.0	0
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7	2.0	4	1	2	1	7.0	0
7	2.0	4	1	2	1	8.0	0
7	2.0	4	1	2	1	9.0	0
7	2.0	4	1	2	1	10	0
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7	2.0	4	1	2	2	3.0	1
7	2.0	4	1	2	2	4.0	1
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7	2.0	4	1	2	2	6.0	1
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7	2.0	4	1	2	2	9.0	1
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7	2.0	4	1	3	1	5.0	1
7	2.0	4	1	3	1	6.0	1
7	2.0	4	1	3	1	7.0	1
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7	2.0	4	1	3	1	9.0	1
7	2.0	4	1	3	1	10	1
7	2.0	4	1	3	2	2.0	0
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7	2.0	4	1	3	2	4.0	0
7	2.0	4	1	3	2	5.0	0
7	2.0	4	1	3	2	6.0	0
7	2.0	4	1	3	2	7.0	0
7	2.0	4	1	3	2	8.0	0
7	2.0	4	1	3	2	9.0	0
7	2.0	4	1	3	2	10	0
7	2.0	4	2	1	1	2.0	0
7	2.0	4	2	1	1	3.0	0
7	2.0	4	2	1	1	4.0	0
7	2.0	4	2	1	1	5.0	0
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7	2.0	4	2	1	1	7.0	0
7	2.0	4	2	1	1	8.0	0
7	2.0	4	2	1	1	9.0	0
7	2.0	4	2	1	1	10	0

A	B	C	D	E	F	G	H
7	2.0	4	2	1	2	2.0	0
7	2.0	4	2	1	2	3.0	0
7	2.0	4	2	1	2	4.0	0
7	2.0	4	2	1	2	5.0	0
7	2.0	4	2	1	2	6.0	0
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7	2.0	4	2	1	2	8.0	0
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7	2.0	4	2	2	2	3.0	1
7	2.0	4	2	2	2	4.0	1
7	2.0	4	2	2	2	5.0	1
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7	2.0	4	2	2	2	9.0	1
7	2.0	4	2	2	2	10	1
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7	2.0	4	2	3	1	4.0	0
7	2.0	4	2	3	1	5.0	0
7	2.0	4	2	3	1	6.0	0
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7	2.0	4	2	3	1	9.0	0
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7	2.0	4	2	3	2	2.0	0
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7	2.0	4	2	3	2	4.0	0
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7	2.0	4	2	3	2	7.0	0
7	2.0	4	2	3	2	8.0	0
7	2.0	4	2	3	2	9.0	0
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7	2.0	5	1	1	1	3.0	1
7	2.0	5	1	1	1	4.0	0
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7	2.0	5	1	1	1	6.0	0
7	2.0	5	1	1	1	7.0	0
7	2.0	5	1	1	1	8.0	0
7	2.0	5	1	1	1	9.0	0
7	2.0	5	1	1	1	10	0
7	2.0	5	1	1	2	2.0	0
7	2.0	5	1	1	2	3.0	0
7	2.0	5	1	1	2	4.0	0
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7	2.0	5	1	1	2	7.0	0
7	2.0	5	1	1	2	8.0	0
7	2.0	5	1	1	2	9.0	0
7	2.0	5	1	1	2	10	0
7	2.0	5	1	2	1	2.0	0
7	2.0	5	1	2	1	3.0	0
7	2.0	5	1	2	1	4.0	0
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7	2.0	5	1	2	1	7.0	0
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7	2.0	5	1	2	1	10	0
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7	2.0	5	1	2	2	3.0	1
7	2.0	5	1	2	2	4.0	1
7	2.0	5	1	2	2	5.0	1
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7	2.0	5	1	2	2	9.0	1
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7	2.0	5	1	3	1	4.0	0
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7	2.0	5	1	3	1	6.0	0
7	2.0	5	1	3	1	7.0	0
7	2.0	5	1	3	1	8.0	0
7	2.0	5	1	3	1	9.0	0
7	2.0	5	1	3	1	10	0
7	2.0	5	1	3	2	2.0	0
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7	2.0	5	1	3	2	4.0	0
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7	2.0	5	1	3	2	8.0	0
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7	2.0	5	2	1	1	2.0	0
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7	2.0	5	2	1	1	4.0	0
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7	2.0	5	2	1	1	7.0	0
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7	2.0	5	2	1	2	2.0	0
7	2.0	5	2	1	2	3.0	0
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7	2.0	5	2	1	2	7.0	0
7	2.0	5	2	1	2	8.0	0
7	2.0	5	2	1	2	9.0	0
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7	2.0	5	2	2	1	4.0	1
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7	2.0	5	2	2	1	9.0	1
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7	2.0	5	2	2	2	9.0	1
7	2.0	5	2	2	2	10	1
7	2.0	5	2	3	1	2.0	0
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7	2.0	5	2	3	1	4.0	0
7	2.0	5	2	3	1	5.0	0
7	2.0	5	2	3	1	6.0	0
7	2.0	5	2	3	1	7.0	0
7	2.0	5	2	3	1	8.0	0
7	2.0	5	2	3	1	9.0	0
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7	2.0	5	2	3	2	4.0	0
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7	2.0	5	2	3	2	7.0	0
7	2.0	5	2	3	2	8.0	0
7	2.0	5	2	3	2	9.0	0
7	2.0	5	2	3	2	10	0
7	3.0	1	1	1	1	3.0	1
7	3.0	1	1	1	1	4.0	1
7	3.0	1	1	1	1	5.0	1
7	3.0	1	1	1	1	6.0	1
7	3.0	1	1	1	1	7.0	1
7	3.0	1	1	1	1	8.0	1
7	3.0	1	1	1	1	9.0	1
7	3.0	1	1	1	1	10	1
7	3.0	1	1	1	2	3.0	2
7	3.0	1	1	1	2	4.0	2
7	3.0	1	1	1	2	5.0	2
7	3.0	1	1	1	2	6.0	2
7	3.0	1	1	1	2	7.0	2
7	3.0	1	1	1	2	8.0	2
7	3.0	1	1	1	2	9.0	2
7	3.0	1	1	1	2	10	2
7	3.0	1	1	2	1	3.0	0
7	3.0	1	1	2	1	4.0	0
7	3.0	1	1	2	1	5.0	0
7	3.0	1	1	2	1	6.0	0
7	3.0	1	1	2	1	7.0	0
7	3.0	1	1	2	1	8.0	0
7	3.0	1	1	2	1	9.0	0
7	3.0	1	1	2	1	10	0
7	3.0	1	1	2	2	3.0	1
7	3.0	1	1	2	2	4.0	1
7	3.0	1	1	2	2	5.0	1
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7	3.0	1	1	2	2	8.0	1
7	3.0	1	1	2	2	9.0	1
7	3.0	1	1	2	2	10	1
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7	3.0	1	1	3	1	4.0	2
7	3.0	1	1	3	1	5.0	2
7	3.0	1	1	3	1	6.0	2
7	3.0	1	1	3	1	7.0	2
7	3.0	1	1	3	1	8.0	2
7	3.0	1	1	3	1	9.0	2
7	3.0	1	1	3	1	10	2
7	3.0	1	1	3	2	3.0	0
7	3.0	1	1	3	2	4.0	0
7	3.0	1	1	3	2	5.0	0
7	3.0	1	1	3	2	6.0	0
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A	B	C	D	E	F	G	H
7	3.0	1	1	3	2	8.0	0
7	3.0	1	1	3	2	9.0	0
7	3.0	1	1	3	2	10	0
7	3.0	1	2	1	1	3.0	1
7	3.0	1	2	1	1	4.0	1
7	3.0	1	2	1	1	5.0	1
7	3.0	1	2	1	1	6.0	1
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7	3.0	1	2	1	1	8.0	1
7	3.0	1	2	1	1	9.0	1
7	3.0	1	2	1	1	10	1
7	3.0	1	2	1	2	3.0	0
7	3.0	1	2	1	2	4.0	0
7	3.0	1	2	1	2	5.0	0
7	3.0	1	2	1	2	6.0	0
7	3.0	1	2	1	2	7.0	0
7	3.0	1	2	1	2	8.0	0
7	3.0	1	2	1	2	9.0	0
7	3.0	1	2	1	2	10	0
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7	3.0	1	2	2	1	4.0	1
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7	3.0	1	2	2	1	9.0	1
7	3.0	1	2	2	1	10	1
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7	3.0	1	2	2	2	5.0	0
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7	3.0	1	2	2	2	7.0	0
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7	3.0	1	2	3	1	9.0	0
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7	3.0	2	1	1	2	8.0	2
7	3.0	2	1	1	2	9.0	2
7	3.0	2	1	1	2	10	2
7	3.0	2	1	2	1	3.0	3
7	3.0	2	1	2	1	4.0	3
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7	3.0	2	1	2	1	8.0	3
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7	3.0	2	1	2	1	10	3
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7	3.0	2	1	2	2	6.0	1
7	3.0	2	1	2	2	7.0	1
7	3.0	2	1	2	2	8.0	1
7	3.0	2	1	2	2	9.0	1
7	3.0	2	1	2	2	10	1
7	3.0	2	1	3	1	3.0	0
7	3.0	2	1	3	1	4.0	0
7	3.0	2	1	3	1	5.0	0
7	3.0	2	1	3	1	6.0	0
7	3.0	2	1	3	1	7.0	0
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7	3.0	2	1	3	1	9.0	0
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7	3.0	2	1	3	2	7.0	0
7	3.0	2	1	3	2	8.0	0
7	3.0	2	1	3	2	9.0	0
7	3.0	2	1	3	2	10	0
7	3.0	2	2	1	1	3.0	3
7	3.0	2	2	1	1	4.0	3
7	3.0	2	2	1	1	5.0	3
7	3.0	2	2	1	1	6.0	3
7	3.0	2	2	1	1	7.0	3
7	3.0	2	2	1	1	8.0	3
7	3.0	2	2	1	1	9.0	3
7	3.0	2	2	1	1	10	3
7	3.0	2	2	1	2	3.0	2
7	3.0	2	2	1	2	4.0	2
7	3.0	2	2	1	2	5.0	2
7	3.0	2	2	1	2	6.0	2
7	3.0	2	2	1	2	7.0	2
7	3.0	2	2	1	2	8.0	2
7	3.0	2	2	1	2	9.0	2
7	3.0	2	2	1	2	10	2
7	3.0	2	2	2	1	3.0	6
7	3.0	2	2	2	1	4.0	6
7	3.0	2	2	2	1	5.0	6
7	3.0	2	2	2	1	6.0	6
7	3.0	2	2	2	1	7.0	6
7	3.0	2	2	2	1	8.0	6
7	3.0	2	2	2	1	9.0	6
7	3.0	2	2	2	1	10	6
7	3.0	2	2	2	2	3.0	7
7	3.0	2	2	2	2	4.0	7
7	3.0	2	2	2	2	5.0	7
7	3.0	2	2	2	2	6.0	7
7	3.0	2	2	2	2	7.0	7
7	3.0	2	2	2	2	8.0	7
7	3.0	2	2	2	2	9.0	7
7	3.0	2	2	2	2	10	7
7	3.0	2	2	3	1	3.0	1
7	3.0	2	2	3	1	4.0	1
7	3.0	2	2	3	1	5.0	1
7	3.0	2	2	3	1	6.0	1
7	3.0	2	2	3	1	7.0	1
7	3.0	2	2	3	1	8.0	1
7	3.0	2	2	3	1	9.0	1
7	3.0	2	2	3	1	10	1
7	3.0	2	2	3	2	3.0	4
7	3.0	2	2	3	2	4.0	4
7	3.0	2	2	3	2	5.0	4
7	3.0	2	2	3	2	6.0	4
7	3.0	2	2	3	2	7.0	4
7	3.0	2	2	3	2	8.0	4
7	3.0	2	2	3	2	9.0	4
7	3.0	2	2	3	2	10	4
7	3.0	3	1	1	1	3.0	0
7	3.0	3	1	1	1	4.0	0
7	3.0	3	1	1	1	5.0	0
7	3.0	3	1	1	1	6.0	0
7	3.0	3	1	1	1	7.0	0
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7	3.0	3	1	1	2	7.0	0
7	3.0	3	1	1	2	8.0	0
7	3.0	3	1	1	2	9.0	0
7	3.0	3	1	1	2	10	0
7	3.0	3	1	2	1	3.0	0
7	3.0	3	1	2	1	4.0	0
7	3.0	3	1	2	1	5.0	0
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7	3.0	3	1	2	2	7.0	0
7	3.0	3	1	2	2	8.0	0
7	3.0	3	1	2	2	9.0	0
7	3.0	3	1	2	2	10	0
7	3.0	3	1	3	1	3.0	0
7	3.0	3	1	3	1	4.0	0
7	3.0	3	1	3	1	5.0	0
7	3.0	3	1	3	1	6.0	0
7	3.0	3	1	3	1	7.0	0
7	3.0	3	1	3	1	8.0	0
7	3.0	3	1	3	1	9.0	0
7	3.0	3	1	3	1	10	0
7	3.0	3	1	3	2	3.0	0
7	3.0	3	1	3	2	4.0	0
7	3.0	3	1	3	2	5.0	0
7	3.0	3	1	3	2	6.0	0
7	3.0	3	1	3	2	7.0	0
7	3.0	3	1	3	2	8.0	0
7	3.0	3	1	3	2	9.0	0
7	3.0	3	1	3	2	10	0
7	3.0	3	2	1	1	3.0	0
7	3.0	3	2	1	1	4.0	0
7	3.0	3	2	1	1	5.0	0

A	B	C	D	E	F	G	H
7	3.0	3	2	1	1	6.0	0
7	3.0	3	2	1	1	7.0	0
7	3.0	3	2	1	1	8.0	0
7	3.0	3	2	1	1	9.0	0
7	3.0	3	2	1	1	10	0
7	3.0	3	2	1	2	3.0	4
7	3.0	3	2	1	2	4.0	4
7	3.0	3	2	1	2	5.0	4
7	3.0	3	2	1	2	6.0	4
7	3.0	3	2	1	2	7.0	4
7	3.0	3	2	1	2	8.0	4
7	3.0	3	2	1	2	9.0	4
7	3.0	3	2	1	2	10	4
7	3.0	3	2	2	1	3.0	1
7	3.0	3	2	2	1	4.0	1
7	3.0	3	2	2	1	5.0	1
7	3.0	3	2	2	1	6.0	1
7	3.0	3	2	2	1	7.0	1
7	3.0	3	2	2	1	8.0	1
7	3.0	3	2	2	1	9.0	1
7	3.0	3	2	2	1	10	1
7	3.0	3	2	2	2	3.0	0
7	3.0	3	2	2	2	4.0	0
7	3.0	3	2	2	2	5.0	0
7	3.0	3	2	2	2	6.0	0
7	3.0	3	2	2	2	7.0	0
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7	3.0	3	2	3	1	10	0
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7	3.0	3	2	3	2	7.0	0
7	3.0	3	2	3	2	8.0	0
7	3.0	3	2	3	2	9.0	0
7	3.0	3	2	3	2	10	0
7	3.0	4	1	1	1	3.0	1
7	3.0	4	1	1	1	4.0	1
7	3.0	4	1	1	1	5.0	1
7	3.0	4	1	1	1	6.0	1
7	3.0	4	1	1	1	7.0	1
7	3.0	4	1	1	1	8.0	1
7	3.0	4	1	1	1	9.0	1
7	3.0	4	1	1	1	10	1
7	3.0	4	1	1	2	3.0	0
7	3.0	4	1	1	2	4.0	0
7	3.0	4	1	1	2	5.0	0
7	3.0	4	1	1	2	6.0	0
7	3.0	4	1	1	2	7.0	0
7	3.0	4	1	1	2	8.0	0
7	3.0	4	1	1	2	9.0	0
7	3.0	4	1	1	2	10	0
7	3.0	4	1	2	1	3.0	0
7	3.0	4	1	2	1	4.0	0
7	3.0	4	1	2	1	5.0	0
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7	3.0	4	1	2	1	8.0	0
7	3.0	4	1	2	1	9.0	0
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7	3.0	4	1	2	2	4.0	1
7	3.0	4	1	2	2	5.0	1
7	3.0	4	1	2	2	6.0	1
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7	3.0	4	1	2	2	8.0	1
7	3.0	4	1	2	2	9.0	1
7	3.0	4	1	2	2	10	1
7	3.0	4	1	3	1	3.0	0
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7	3.0	4	1	3	1	5.0	0
7	3.0	4	1	3	1	6.0	0
7	3.0	4	1	3	1	7.0	0
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7	3.0	4	1	3	2	8.0	0
7	3.0	4	1	3	2	9.0	0
7	3.0	4	1	3	2	10	0
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7	3.0	4	2	1	1	5.0	0
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7	3.0	4	2	1	1	9.0	0
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7	3.0	4	2	1	2	5.0	0
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7	3.0	4	2	1	2	7.0	0
7	3.0	4	2	1	2	8.0	0
7	3.0	4	2	1	2	9.0	0
7	3.0	4	2	1	2	10	0
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7	3.0	4	2	2	1	7.0	0
7	3.0	4	2	2	1	8.0	0
7	3.0	4	2	2	1	9.0	0
7	3.0	4	2	2	1	10	0
7	3.0	4	2	2	2	3.0	0
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7	3.0	4	2	2	2	5.0	0
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7	3.0	4	2	2	2	7.0	0
7	3.0	4	2	2	2	8.0	0
7	3.0	4	2	2	2	9.0	0
7	3.0	4	2	2	2	10	0
7	3.0	4	2	3	1	3.0	0
7	3.0	4	2	3	1	4.0	0
7	3.0	4	2	3	1	5.0	0
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7	3.0	4	2	3	1	7.0	0
7	3.0	4	2	3	1	8.0	0
7	3.0	4	2	3	1	9.0	0
7	3.0	4	2	3	1	10	0
7	3.0	4	2	3	2	3.0	0
7	3.0	4	2	3	2	4.0	0
7	3.0	4	2	3	2	5.0	0
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7	3.0	4	2	3	2	10	0
7	3.0	5	1	1	1	3.0	0
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7	3.0	5	1	1	1	8.0	0
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7	3.0	5	1	1	2	7.0	0
7	3.0	5	1	1	2	8.0	0
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7	3.0	5	1	1	2	10	0
7	3.0	5	1	2	1	3.0	1
7	3.0	5	1	2	1	4.0	1
7	3.0	5	1	2	1	5.0	1
7	3.0	5	1	2	1	6.0	1
7	3.0	5	1	2	1	7.0	1
7	3.0	5	1	2	1	8.0	1
7	3.0	5	1	2	1	9.0	1
7	3.0	5	1	2	1	10	1
7	3.0	5	1	2	2	3.0	1
7	3.0	5	1	2	2	4.0	1
7	3.0	5	1	2	2	5.0	0
7	3.0	5	1	2	2	6.0	0
7	3.0	5	1	2	2	7.0	0
7	3.0	5	1	2	2	8.0	0
7	3.0	5	1	2	2	9.0	0
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7	3.0	5	1	3	1	7.0	0
7	3.0	5	1	3	1	8.0	0
7	3.0	5	1	3	1	9.0	0
7	3.0	5	1	3	1	10	0
7	3.0	5	1	3	2	3.0	0
7	3.0	5	1	3	2	4.0	0
7	3.0	5	1	3	2	5.0	0
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7	3.0	5	2	1	1	4.0	0
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7	3.0	5	2	1	1	6.0	0
7	3.0	5	2	1	1	7.0	0
7	3.0	5	2	1	1	8.0	0
7	3.0	5	2	1	1	9.0	0
7	3.0	5	2	1	1	10	0
7	3.0	5	2	1	2	3.0	1

A	B	C	D	E	F	G	H
7	3.0	5	2	1	2	4.0	1
7	3.0	5	2	1	2	5.0	1
7	3.0	5	2	1	2	6.0	1
7	3.0	5	2	1	2	7.0	1
7	3.0	5	2	1	2	8.0	1
7	3.0	5	2	1	2	9.0	1
7	3.0	5	2	1	2	10	1
7	3.0	5	2	2	1	3.0	1
7	3.0	5	2	2	1	4.0	1
7	3.0	5	2	2	1	5.0	1
7	3.0	5	2	2	1	6.0	1
7	3.0	5	2	2	1	7.0	1
7	3.0	5	2	2	1	8.0	1
7	3.0	5	2	2	1	9.0	1
7	3.0	5	2	2	1	10	1
7	3.0	5	2	2	2	3.0	1
7	3.0	5	2	2	2	4.0	1
7	3.0	5	2	2	2	5.0	1
7	3.0	5	2	2	2	6.0	1
7	3.0	5	2	2	2	7.0	1
7	3.0	5	2	2	2	8.0	1
7	3.0	5	2	2	2	9.0	1
7	3.0	5	2	2	2	10	1
7	3.0	5	2	3	1	3.0	0
7	3.0	5	2	3	1	4.0	0
7	3.0	5	2	3	1	5.0	0
7	3.0	5	2	3	1	6.0	0
7	3.0	5	2	3	1	7.0	0
7	3.0	5	2	3	1	8.0	0
7	3.0	5	2	3	1	9.0	0
7	3.0	5	2	3	1	10	0
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7	3.0	5	2	3	2	6.0	0
7	3.0	5	2	3	2	7.0	0
7	3.0	5	2	3	2	8.0	0
7	3.0	5	2	3	2	9.0	0
7	3.0	5	2	3	2	10	0
7	4.0	1	1	1	1	4.0	0
7	4.0	1	1	1	1	5.0	0
7	4.0	1	1	1	1	6.0	0
7	4.0	1	1	1	1	7.0	0
7	4.0	1	1	1	1	8.0	0
7	4.0	1	1	1	1	9.0	0
7	4.0	1	1	1	1	10	0
7	4.0	1	1	1	2	4.0	0
7	4.0	1	1	1	2	5.0	0
7	4.0	1	1	1	2	6.0	0
7	4.0	1	1	1	2	7.0	0
7	4.0	1	1	1	2	8.0	0
7	4.0	1	1	1	2	9.0	0
7	4.0	1	1	1	2	10	0
7	4.0	1	1	2	1	4.0	0
7	4.0	1	1	2	1	5.0	0
7	4.0	1	1	2	1	6.0	0
7	4.0	1	1	2	1	7.0	0
7	4.0	1	1	2	1	8.0	0
7	4.0	1	1	2	1	9.0	0
7	4.0	1	1	2	1	10	0
7	4.0	1	1	2	2	4.0	0
7	4.0	1	1	2	2	5.0	0
7	4.0	1	1	2	2	6.0	0
7	4.0	1	1	2	2	7.0	0
7	4.0	1	1	2	2	8.0	0
7	4.0	1	1	2	2	9.0	0

A	B	C	D	E	F	G	H
7	4.0	1	1	2	2	10	0
7	4.0	1	1	3	1	4.0	0
7	4.0	1	1	3	1	5.0	0
7	4.0	1	1	3	1	6.0	0
7	4.0	1	1	3	1	7.0	0
7	4.0	1	1	3	1	8.0	0
7	4.0	1	1	3	1	9.0	0
7	4.0	1	1	3	1	10	0
7	4.0	1	1	3	2	4.0	0
7	4.0	1	1	3	2	5.0	0
7	4.0	1	1	3	2	6.0	0
7	4.0	1	1	3	2	7.0	0
7	4.0	1	1	3	2	8.0	0
7	4.0	1	1	3	2	9.0	0
7	4.0	1	1	3	2	10	0
7	4.0	1	2	1	1	4.0	0
7	4.0	1	2	1	1	5.0	0
7	4.0	1	2	1	1	6.0	0
7	4.0	1	2	1	1	7.0	0
7	4.0	1	2	1	1	8.0	0
7	4.0	1	2	1	1	9.0	0
7	4.0	1	2	1	1	10	0
7	4.0	1	2	1	2	4.0	0
7	4.0	1	2	1	2	5.0	0
7	4.0	1	2	1	2	6.0	0
7	4.0	1	2	1	2	7.0	0
7	4.0	1	2	1	2	8.0	0
7	4.0	1	2	1	2	9.0	0
7	4.0	1	2	1	2	10	0
7	4.0	1	2	2	1	4.0	0
7	4.0	1	2	2	1	5.0	0
7	4.0	1	2	2	1	6.0	0
7	4.0	1	2	2	1	7.0	0
7	4.0	1	2	2	1	8.0	0
7	4.0	1	2	2	1	9.0	0
7	4.0	1	2	2	1	10	0
7	4.0	1	2	2	2	4.0	0
7	4.0	1	2	2	2	5.0	0
7	4.0	1	2	2	2	6.0	0
7	4.0	1	2	2	2	7.0	0
7	4.0	1	2	2	2	8.0	0
7	4.0	1	2	2	2	9.0	0
7	4.0	1	2	2	2	10	0
7	4.0	1	2	3	1	4.0	0
7	4.0	1	2	3	1	5.0	0
7	4.0	1	2	3	1	6.0	0
7	4.0	1	2	3	1	7.0	0
7	4.0	1	2	3	1	8.0	0
7	4.0	1	2	3	1	9.0	0
7	4.0	1	2	3	1	10	0
7	4.0	1	2	3	2	4.0	2
7	4.0	1	2	3	2	5.0	2
7	4.0	1	2	3	2	6.0	2
7	4.0	1	2	3	2	7.0	2
7	4.0	1	2	3	2	8.0	2
7	4.0	1	2	3	2	9.0	2
7	4.0	1	2	3	2	10	2
7	4.0	2	1	1	1	4.0	0
7	4.0	2	1	1	1	5.0	0
7	4.0	2	1	1	1	6.0	0
7	4.0	2	1	1	1	7.0	0
7	4.0	2	1	1	1	8.0	0
7	4.0	2	1	1	1	9.0	0
7	4.0	2	1	1	1	10	0
7	4.0	2	1	1	2	4.0	0
7	4.0	2	1	1	2	5.0	0

A	B	C	D	E	F	G	H
7	4.0	2	1	1	2	6.0	0
7	4.0	2	1	1	2	7.0	0
7	4.0	2	1	1	2	8.0	0
7	4.0	2	1	1	2	9.0	0
7	4.0	2	1	1	2	10	0
7	4.0	2	1	2	1	4.0	0
7	4.0	2	1	2	1	5.0	0
7	4.0	2	1	2	1	6.0	0
7	4.0	2	1	2	1	7.0	0
7	4.0	2	1	2	1	8.0	0
7	4.0	2	1	2	1	9.0	0
7	4.0	2	1	2	1	10	0
7	4.0	2	1	2	2	4.0	2
7	4.0	2	1	2	2	5.0	2
7	4.0	2	1	2	2	6.0	2
7	4.0	2	1	2	2	7.0	2
7	4.0	2	1	2	2	8.0	2
7	4.0	2	1	2	2	9.0	2
7	4.0	2	1	2	2	10	2
7	4.0	2	1	3	1	4.0	0
7	4.0	2	1	3	1	5.0	0
7	4.0	2	1	3	1	6.0	0
7	4.0	2	1	3	1	7.0	0
7	4.0	2	1	3	1	8.0	0
7	4.0	2	1	3	1	9.0	0
7	4.0	2	1	3	1	10	0
7	4.0	2	1	3	2	4.0	1
7	4.0	2	1	3	2	5.0	1
7	4.0	2	1	3	2	6.0	1
7	4.0	2	1	3	2	7.0	1
7	4.0	2	1	3	2	8.0	1
7	4.0	2	1	3	2	9.0	1
7	4.0	2	1	3	2	10	1
7	4.0	2	2	1	1	4.0	0
7	4.0	2	2	1	1	5.0	0
7	4.0	2	2	1	1	6.0	0
7	4.0	2	2	1	1	7.0	0
7	4.0	2	2	1	1	8.0	0
7	4.0	2	2	1	1	9.0	0
7	4.0	2	2	1	1	10	0
7	4.0	2	2	1	2	4.0	0
7	4.0	2	2	1	2	5.0	0
7	4.0	2	2	1	2	6.0	0
7	4.0	2	2	1	2	7.0	0
7	4.0	2	2	1	2	8.0	0
7	4.0	2	2	1	2	9.0	0
7	4.0	2	2	1	2	10	0
7	4.0	2	2	2	1	4.0	2
7	4.0	2	2	2	1	5.0	2
7	4.0	2	2	2	1	6.0	2
7	4.0	2	2	2	1	7.0	2
7	4.0	2	2	2	1	8.0	2
7	4.0	2	2	2	1	9.0	2
7	4.0	2	2	2	1	10	2
7	4.0	2	2	2	2	4.0	1
7	4.0	2	2	2	2	5.0	1
7	4.0	2	2	2	2	6.0	1
7	4.0	2	2	2	2	7.0	1
7	4.0	2	2	2	2	8.0	1
7	4.0	2	2	2	2	9.0	1
7	4.0	2	2	2	2	10	1
7	4.0	2	2	3	1	4.0	0
7	4.0	2	2	3	1	5.0	0
7	4.0	2	2	3	1	6.0	0
7	4.0	2	2	3	1	7.0	0
7	4.0	2	2	3	1	8.0	0

A	B	C	D	E	F	G	H
7	4.0	2	2	3	1	9.0	0
7	4.0	2	2	3	1	10	0
7	4.0	2	2	3	2	4.0	0
7	4.0	2	2	3	2	5.0	0
7	4.0	2	2	3	2	6.0	0
7	4.0	2	2	3	2	7.0	0
7	4.0	2	2	3	2	8.0	0
7	4.0	2	2	3	2	9.0	0
7	4.0	2	2	3	2	10	0
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7	4.0	3	1	1	1	5.0	0
7	4.0	3	1	1	1	6.0	0
7	4.0	3	1	1	1	7.0	0
7	4.0	3	1	1	1	8.0	0
7	4.0	3	1	1	1	9.0	0
7	4.0	3	1	1	1	10	0
7	4.0	3	1	1	2	4.0	0
7	4.0	3	1	1	2	5.0	0
7	4.0	3	1	1	2	6.0	0
7	4.0	3	1	1	2	7.0	0
7	4.0	3	1	1	2	8.0	0
7	4.0	3	1	1	2	9.0	0
7	4.0	3	1	1	2	10	0
7	4.0	3	1	2	1	4.0	0
7	4.0	3	1	2	1	5.0	0
7	4.0	3	1	2	1	6.0	0
7	4.0	3	1	2	1	7.0	0
7	4.0	3	1	2	1	8.0	0
7	4.0	3	1	2	1	9.0	0
7	4.0	3	1	2	1	10	0
7	4.0	3	1	2	2	4.0	0
7	4.0	3	1	2	2	5.0	0
7	4.0	3	1	2	2	6.0	0
7	4.0	3	1	2	2	7.0	0
7	4.0	3	1	2	2	8.0	0
7	4.0	3	1	2	2	9.0	0
7	4.0	3	1	2	2	10	0
7	4.0	3	1	3	1	4.0	0
7	4.0	3	1	3	1	5.0	0
7	4.0	3	1	3	1	6.0	0
7	4.0	3	1	3	1	7.0	0
7	4.0	3	1	3	1	8.0	0
7	4.0	3	1	3	1	9.0	0
7	4.0	3	1	3	1	10	0
7	4.0	3	1	3	2	4.0	0
7	4.0	3	1	3	2	5.0	0
7	4.0	3	1	3	2	6.0	0
7	4.0	3	1	3	2	7.0	0
7	4.0	3	1	3	2	8.0	0
7	4.0	3	1	3	2	9.0	0
7	4.0	3	1	3	2	10	0
7	4.0	3	2	1	1	4.0	0
7	4.0	3	2	1	1	5.0	0
7	4.0	3	2	1	1	6.0	0
7	4.0	3	2	1	1	7.0	0
7	4.0	3	2	1	1	8.0	0
7	4.0	3	2	1	1	9.0	0
7	4.0	3	2	1	1	10	0
7	4.0	3	2	1	2	4.0	0
7	4.0	3	2	1	2	5.0	0
7	4.0	3	2	1	2	6.0	0
7	4.0	3	2	1	2	7.0	0
7	4.0	3	2	1	2	8.0	0
7	4.0	3	2	1	2	9.0	0
7	4.0	3	2	1	2	10	0
7	4.0	3	2	2	1	4.0	0
7	4.0	3	2	2	1	5.0	0
7	4.0	3	2	2	1	6.0	0
7	4.0	3	2	2	1	7.0	0
7	4.0	3	2	2	1	8.0	0
7	4.0	3	2	2	1	9.0	0
7	4.0	3	2	2	1	10	0
7	4.0	3	2	2	2	4.0	0
7	4.0	3	2	2	2	5.0	0
7	4.0	3	2	2	2	6.0	0
7	4.0	3	2	2	2	7.0	0
7	4.0	3	2	2	2	8.0	0
7	4.0	3	2	2	2	9.0	0
7	4.0	3	2	2	2	10	0
7	4.0	3	2	3	1	4.0	0
7	4.0	3	2	3	1	5.0	0
7	4.0	3	2	3	1	6.0	0
7	4.0	3	2	3	1	7.0	0
7	4.0	3	2	3	1	8.0	0
7	4.0	3	2	3	1	9.0	0
7	4.0	3	2	3	1	10	0
7	4.0	3	2	3	2	4.0	0
7	4.0	3	2	3	2	5.0	0
7	4.0	3	2	3	2	6.0	0
7	4.0	3	2	3	2	7.0	0
7	4.0	3	2	3	2	8.0	0
7	4.0	3	2	3	2	9.0	0
7	4.0	3	2	3	2	10	0
7	4.0	4	1	1	1	4.0	0
7	4.0	4	1	1	1	5.0	0
7	4.0	4	1	1	1	6.0	0
7	4.0	4	1	1	1	7.0	0
7	4.0	4	1	1	1	8.0	0
7	4.0	4	1	1	1	9.0	0
7	4.0	4	1	1	1	10	0
7	4.0	4	1	1	2	4.0	0
7	4.0	4	1	1	2	5.0	0
7	4.0	4	1	1	2	6.0	0
7	4.0	4	1	1	2	7.0	0
7	4.0	4	1	1	2	8.0	0
7	4.0	4	1	1	2	9.0	0
7	4.0	4	1	1	2	10	0
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7	4.0	4	1	2	1	7.0	0
7	4.0	4	1	2	1	8.0	0
7	4.0	4	1	2	1	9.0	0
7	4.0	4	1	2	1	10	0
7	4.0	4	1	2	2	4.0	0
7	4.0	4	1	2	2	5.0	0
7	4.0	4	1	2	2	6.0	0
7	4.0	4	1	2	2	7.0	0
7	4.0	4	1	2	2	8.0	0
7	4.0	4	1	2	2	9.0	0
7	4.0	4	1	2	2	10	0
7	4.0	4	1	3	1	4.0	1
7	4.0	4	1	3	1	5.0	1
7	4.0	4	1	3	1	6.0	1
7	4.0	4	1	3	1	7.0	1
7	4.0	4	1	3	1	8.0	1
7	4.0	4	1	3	1	9.0	1
7	4.0	4	1	3	1	10	1
7	4.0	4	1	3	2	4.0	0
7	4.0	4	1	3	2	5.0	0
7	4.0	4	1	3	2	6.0	0
7	4.0	4	1	3	2	7.0	0
7	4.0	4	1	3	2	8.0	0
7	4.0	4	1	3	2	9.0	0
7	4.0	4	1	3	2	10	0
7	4.0	4	2	1	1	4.0	1
7	4.0	4	2	1	1	5.0	1
7	4.0	4	2	1	1	6.0	1
7	4.0	4	2	1	1	7.0	1
7	4.0	4	2	1	1	8.0	1
7	4.0	4	2	1	1	9.0	1
7	4.0	4	2	1	1	10	1
7	4.0	4	2	1	2	4.0	1
7	4.0	4	2	1	2	5.0	1
7	4.0	4	2	1	2	6.0	1
7	4.0	4	2	1	2	7.0	1
7	4.0	4	2	1	2	8.0	1
7	4.0	4	2	1	2	9.0	1
7	4.0	4	2	1	2	10	1
7	4.0	4	2	2	1	4.0	0
7	4.0	4	2	2	1	5.0	0
7	4.0	4	2	2	1	6.0	0
7	4.0	4	2	2	1	7.0	0
7	4.0	4	2	2	1	8.0	0
7	4.0	4	2	2	1	9.0	0
7	4.0	4	2	2	1	10	0
7	4.0	4	2	2	2	4.0	0
7	4.0	4	2	2	2	5.0	0
7	4.0	4	2	2	2	6.0	0
7	4.0	4	2	2	2	7.0	0
7	4.0	4	2	2	2	8.0	0
7	4.0	4	2	2	2	9.0	0
7	4.0	4	2	2	2	10	0
7	4.0	4	2	3	1	4.0	0
7	4.0	4	2	3	1	5.0	0
7	4.0	4	2	3	1	6.0	0
7	4.0	4	2	3	1	7.0	0
7	4.0	4	2	3	1	8.0	0
7	4.0	4	2	3	1	9.0	0
7	4.0	4	2	3	1	10	0
7	4.0	4	2	3	2	4.0	1
7	4.0	4	2	3	2	5.0	1
7	4.0	4	2	3	2	6.0	1
7	4.0	4	2	3	2	7.0	1
7	4.0	4	2	3	2	8.0	1
7	4.0	4	2	3	2	9.0	1
7	4.0	4	2	3	2	10	1
7	4.0	5	1	1	1	4.0	0
7	4.0	5	1	1	1	5.0	0
7	4.0	5	1	1	1	6.0	0
7	4.0	5	1	1	1	7.0	0
7	4.0	5	1	1	1	8.0	0
7	4.0	5	1	1	1	9.0	0
7	4.0	5	1	1	1	10	0
7	4.0	5	1	1	2	4.0	1
7	4.0	5	1	1	2	5.0	1
7	4.0	5	1	1	2	6.0	1
7	4.0	5	1	1	2	7.0	1
7	4.0	5	1	1	2	8.0	1
7	4.0	5	1	1	2	9.0	1
7	4.0	5	1	1	2	10	1
7	4.0	5	1	2	1	4.0	0
7	4.0	5	1	2	1	5.0	0
7	4.0	5	1	2	1	6.0	0
7	4.0	5	1	2	1	7.0	0
7	4.0	5	1	2	1	8.0	0
7	4.0	5	1	2	1	9.0	0
7	4.0	5	1	2	1	10	0

A	B	C	D	E	F	G	H
7	4.0	5	1	2	2	4.0	0
7	4.0	5	1	2	2	5.0	0
7	4.0	5	1	2	2	6.0	0
7	4.0	5	1	2	2	7.0	0
7	4.0	5	1	2	2	8.0	0
7	4.0	5	1	2	2	9.0	0
7	4.0	5	1	2	2	10	0
7	4.0	5	1	3	1	4.0	1
7	4.0	5	1	3	1	5.0	1
7	4.0	5	1	3	1	6.0	1
7	4.0	5	1	3	1	7.0	1
7	4.0	5	1	3	1	8.0	1
7	4.0	5	1	3	1	9.0	1
7	4.0	5	1	3	1	10	1
7	4.0	5	1	3	2	4.0	0
7	4.0	5	1	3	2	5.0	0
7	4.0	5	1	3	2	6.0	0
7	4.0	5	1	3	2	7.0	0
7	4.0	5	1	3	2	8.0	0
7	4.0	5	1	3	2	9.0	0
7	4.0	5	1	3	2	10	0
7	4.0	5	2	1	1	4.0	0
7	4.0	5	2	1	1	5.0	0
7	4.0	5	2	1	1	6.0	0
7	4.0	5	2	1	1	7.0	0
7	4.0	5	2	1	1	8.0	0
7	4.0	5	2	1	1	9.0	0
7	4.0	5	2	1	1	10	0
7	4.0	5	2	1	2	4.0	1
7	4.0	5	2	1	2	5.0	1
7	4.0	5	2	1	2	6.0	1
7	4.0	5	2	1	2	7.0	1
7	4.0	5	2	1	2	8.0	1
7	4.0	5	2	1	2	9.0	1
7	4.0	5	2	1	2	10	1
7	4.0	5	2	2	1	4.0	0
7	4.0	5	2	2	1	5.0	0
7	4.0	5	2	2	1	6.0	0
7	4.0	5	2	2	1	7.0	0
7	4.0	5	2	2	1	8.0	0
7	4.0	5	2	2	1	9.0	0
7	4.0	5	2	2	1	10	0
7	4.0	5	2	2	2	4.0	1
7	4.0	5	2	2	2	5.0	1
7	4.0	5	2	2	2	6.0	1
7	4.0	5	2	2	2	7.0	1
7	4.0	5	2	2	2	8.0	1
7	4.0	5	2	2	2	9.0	1
7	4.0	5	2	2	2	10	1
7	4.0	5	2	3	1	4.0	0
7	4.0	5	2	3	1	5.0	0
7	4.0	5	2	3	1	6.0	0
7	4.0	5	2	3	1	7.0	0
7	4.0	5	2	3	1	8.0	0
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7	4.0	5	2	3	2	6.0	0
7	4.0	5	2	3	2	7.0	0
7	4.0	5	2	3	2	8.0	0
7	4.0	5	2	3	2	9.0	0
7	4.0	5	2	3	2	10	0
7	5.0	1	1	1	1	5.0	0
7	5.0	1	1	1	1	6.0	0
7	5.0	1	1	1	1	7.0	0
7	5.0	1	1	1	1	8.0	0
7	5.0	1	1	1	1	9.0	0
7	5.0	1	1	1	1	10	0
7	5.0	1	1	1	2	5.0	1
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7	5.0	1	1	1	2	8.0	0
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7	5.0	1	1	2	1	7.0	0
7	5.0	1	1	2	1	8.0	0
7	5.0	1	1	2	1	9.0	0
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7	5.0	1	1	2	2	5.0	0
7	5.0	1	1	2	2	6.0	0
7	5.0	1	1	2	2	7.0	0
7	5.0	1	1	2	2	8.0	0
7	5.0	1	1	2	2	9.0	0
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7	5.0	1	1	3	1	5.0	0
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7	5.0	1	1	3	1	8.0	0
7	5.0	1	1	3	1	9.0	0
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7	5.0	1	1	3	2	7.0	0
7	5.0	1	1	3	2	8.0	0
7	5.0	1	1	3	2	9.0	0
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7	5.0	1	2	1	1	6.0	0
7	5.0	1	2	1	1	7.0	0
7	5.0	1	2	1	1	8.0	0
7	5.0	1	2	1	1	9.0	0
7	5.0	1	2	1	1	10	0
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7	5.0	1	2	1	2	6.0	0
7	5.0	1	2	1	2	7.0	0
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7	5.0	1	2	1	2	10	0
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7	5.0	1	2	2	1	9.0	1
7	5.0	1	2	2	1	10	1
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7	5.0	2	1	1	1	9.0	0
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7	5.0	2	2	1	1	7.0	0
7	5.0	2	2	1	1	8.0	0
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7	5.0	2	2	1	1	10	0
7	5.0	2	2	1	2	5.0	0
7	5.0	2	2	1	2	6.0	0
7	5.0	2	2	1	2	7.0	0
7	5.0	2	2	1	2	8.0	0
7	5.0	2	2	1	2	9.0	0
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7	5.0	2	2	2	2	9.0	0
7	5.0	2	2	2	2	10	0
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A	B	C	D	E	F	G	H
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7	5.0	2	2	3	2	6.0	0
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7	5.0	2	2	3	2	8.0	0
7	5.0	2	2	3	2	9.0	0
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7	5.0	3	1	1	1	7.0	0
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7	5.0	3	1	1	2	10	0
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7	5.0	3	2	1	2	9.0	1
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7	5.0	3	2	2	1	9.0	0
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7	5.0	4	1	1	1	7.0	0
7	5.0	4	1	1	1	8.0	0
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7	5.0	4	2	1	2	9.0	0
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7	5.0	4	2	3	1	6.0	1
7	5.0	4	2	3	1	7.0	1
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7	5.0	4	2	3	1	9.0	1
7	5.0	4	2	3	1	10	1
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7	5.0	4	2	3	2	7.0	0
7	5.0	4	2	3	2	8.0	0
7	5.0	4	2	3	2	9.0	0
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7	5.0	5	2	1	1	8.0	0
7	5.0	5	2	1	1	9.0	0
7	5.0	5	2	1	1	10	0
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7	5.0	5	2	1	2	6.0	1
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A	B	C	D	E	F	G	H
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7	5.0	5	2	1	2	10	1
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7	5.0	5	2	2	1	7.0	0
7	5.0	5	2	2	1	8.0	0
7	5.0	5	2	2	1	9.0	0
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7	5.0	5	2	3	1	10	0
7	5.0	5	2	3	2	5.0	1
7	5.0	5	2	3	2	6.0	0
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7	5.0	5	2	3	2	8.0	0
7	5.0	5	2	3	2	9.0	0
7	5.0	5	2	3	2	10	0
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7	6.0	1	1	1	1	10	0
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7	6.0	1	1	2	2	8.0	0
7	6.0	1	1	2	2	9.0	0
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7	6.0	1	1	3	1	6.0	0
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7	6.0	1	1	3	1	8.0	0
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7	6.0	1	2	1	1	7.0	0
7	6.0	1	2	1	1	8.0	0
7	6.0	1	2	1	1	9.0	0
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7	6.0	1	2	1	2	6.0	0
7	6.0	1	2	1	2	7.0	0
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7	7.0	3	2	2	1	10	0
7	7.0	3	2	2	2	7.0	0
7	7.0	3	2	2	2	8.0	0
7	7.0	3	2	2	2	9.0	0
7	7.0	3	2	2	2	10	0
7	7.0	3	2	3	1	7.0	0
7	7.0	3	2	3	1	8.0	0
7	7.0	3	2	3	1	9.0	0
7	7.0	3	2	3	1	10	0
7	7.0	3	2	3	2	7.0	0
7	7.0	3	2	3	2	8.0	0
7	7.0	3	2	3	2	9.0	0
7	7.0	3	2	3	2	10	0
7	7.0	4	1	1	1	7.0	0
7	7.0	4	1	1	1	8.0	0
7	7.0	4	1	1	1	9.0	0
7	7.0	4	1	1	1	10	0
7	7.0	4	1	1	2	7.0	0
7	7.0	4	1	1	2	8.0	0
7	7.0	4	1	1	2	9.0	0
7	7.0	4	1	1	2	10	0
7	7.0	4	1	2	1	7.0	0
7	7.0	4	1	2	1	8.0	0
7	7.0	4	1	2	1	9.0	0
7	7.0	4	1	2	1	10	0
7	7.0	4	1	2	2	7.0	0
7	7.0	4	1	2	2	8.0	0
7	7.0	4	1	2	2	9.0	0
7	7.0	4	1	2	2	10	0
7	7.0	4	1	3	1	7.0	0
7	7.0	4	1	3	1	8.0	0
7	7.0	4	1	3	1	9.0	0
7	7.0	4	1	3	1	10	0
7	7.0	4	1	3	2	7.0	0
7	7.0	4	1	3	2	8.0	0
7	7.0	4	1	3	2	9.0	0
7	7.0	4	1	3	2	10	0
7	7.0	4	2	1	1	7.0	0
7	7.0	4	2	1	1	8.0	0
7	7.0	4	2	1	1	9.0	0
7	7.0	4	2	1	1	10	0
7	7.0	4	2	1	2	7.0	0
7	7.0	4	2	1	2	8.0	0
7	7.0	4	2	1	2	9.0	0
7	7.0	4	2	1	2	10	0
7	7.0	4	2	2	1	7.0	1
7	7.0	4	2	2	1	8.0	1
7	7.0	4	2	2	1	9.0	1
7	7.0	4	2	2	1	10	1
7	7.0	4	2	2	2	7.0	0
7	7.0	4	2	2	2	8.0	0
7	7.0	4	2	2	2	9.0	0
7	7.0	4	2	2	2	10	0
7	7.0	4	2	3	1	7.0	0
7	7.0	4	2	3	1	8.0	0
7	7.0	4	2	3	1	9.0	0
7	7.0	4	2	3	1	10	0
7	7.0	4	2	3	2	7.0	0
7	7.0	4	2	3	2	8.0	0
7	7.0	4	2	3	2	9.0	0
7	7.0	4	2	3	2	10	0
7	7.0	5	1	1	1	7.0	0
7	7.0	5	1	1	1	8.0	0
7	7.0	5	1	1	1	9.0	0
7	7.0	5	1	1	1	10	0
7	7.0	5	1	1	2	7.0	0
7	7.0	5	1	1	2	8.0	0
7	7.0	5	1	1	2	9.0	0
7	7.0	5	1	1	2	10	0
7	7.0	5	1	2	1	7.0	0
7	7.0	5	1	2	1	8.0	0
7	7.0	5	1	2	1	9.0	0
7	7.0	5	1	2	1	10	0
7	7.0	5	1	2	2	7.0	0
7	7.0	5	1	2	2	8.0	0
7	7.0	5	1	2	2	9.0	0
7	7.0	5	1	2	2	10	0
7	7.0	5	1	3	1	7.0	0
7	7.0	5	1	3	1	8.0	0
7	7.0	5	1	3	1	9.0	0
7	7.0	5	1	3	1	10	0
7	7.0	5	1	3	2	7.0	0
7	7.0	5	1	3	2	8.0	0
7	7.0	5	1	3	2	9.0	0
7	7.0	5	1	3	2	10	0
7	7.0	5	2	1	1	7.0	0
7	7.0	5	2	1	1	8.0	0
7	7.0	5	2	1	1	9.0	0
7	7.0	5	2	1	1	10	0
7	7.0	5	2	1	2	7.0	0
7	7.0	5	2	1	2	8.0	0
7	7.0	5	2	1	2	9.0	0
7	7.0	5	2	1	2	10	0
7	7.0	5	2	2	1	7.0	0
7	7.0	5	2	2	1	8.0	0
7	7.0	5	2	2	1	9.0	0
7	7.0	5	2	2	1	10	0
7	7.0	5	2	2	2	7.0	0
7	7.0	5	2	2	2	8.0	0
7	7.0	5	2	2	2	9.0	0
7	7.0	5	2	2	2	10	0
7	7.0	5	2	3	1	7.0	0
7	7.0	5	2	3	1	8.0	0
7	7.0	5	2	3	1	9.0	0
7	7.0	5	2	3	1	10	0
7	7.0	5	2	3	2	7.0	0
7	7.0	5	2	3	2	8.0	0
7	7.0	5	2	3	2	9.0	0
7	7.0	5	2	3	2	10	0
7	8.0	1	1	1	1	8.0	0
7	8.0	1	1	1	1	9.0	0
7	8.0	1	1	1	1	10	0
7	8.0	1	1	1	2	8.0	0
7	8.0	1	1	1	2	9.0	0
7	8.0	1	1	1	2	10	0
7	8.0	1	1	2	1	8.0	0
7	8.0	1	1	2	1	9.0	0
7	8.0	1	1	2	1	10	0
7	8.0	1	1	2	2	8.0	0
7	8.0	1	1	2	2	9.0	0
7	8.0	1	1	2	2	10	0
7	8.0	1	1	3	1	8.0	0
7	8.0	1	1	3	1	9.0	0
7	8.0	1	1	3	1	10	0
7	8.0	1	1	3	2	8.0	0
7	8.0	1	1	3	2	9.0	0
7	8.0	1	1	3	2	10	0
7	8.0	1	2	1	1	8.0	0
7	8.0	1	2	1	1	9.0	0
7	8.0	1	2	1	1	10	0
7	8.0	1	2	1	2	8.0	0
7	8.0	1	2	1	2	9.0	0
7	8.0	1	2	1	2	10	0
7	8.0	1	2	2	1	8.0	0
7	8.0	1	2	2	1	9.0	0
7	8.0	1	2	2	1	10	0

A	B	C	D	E	F	G	H
7	8.0	1	2	2	2	8.0	0
7	8.0	1	2	2	2	9.0	0
7	8.0	1	2	2	2	10	0
7	8.0	1	2	3	1	8.0	0
7	8.0	1	2	3	1	9.0	0
7	8.0	1	2	3	1	10	0
7	8.0	1	2	3	2	8.0	0
7	8.0	1	2	3	2	9.0	0
7	8.0	1	2	3	2	10	0
7	8.0	2	1	1	1	8.0	0
7	8.0	2	1	1	1	9.0	0
7	8.0	2	1	1	1	10	0
7	8.0	2	1	1	2	8.0	0
7	8.0	2	1	1	2	9.0	0
7	8.0	2	1	1	2	10	0
7	8.0	2	1	2	1	8.0	0
7	8.0	2	1	2	1	9.0	0
7	8.0	2	1	2	1	10	0
7	8.0	2	1	2	2	8.0	0
7	8.0	2	1	2	2	9.0	0
7	8.0	2	1	2	2	10	0
7	8.0	2	1	3	1	8.0	0
7	8.0	2	1	3	1	9.0	0
7	8.0	2	1	3	1	10	0
7	8.0	2	1	3	2	8.0	0
7	8.0	2	1	3	2	9.0	0
7	8.0	2	1	3	2	10	0
7	8.0	2	2	1	1	8.0	0
7	8.0	2	2	1	1	9.0	0
7	8.0	2	2	1	1	10	0
7	8.0	2	2	1	2	8.0	0
7	8.0	2	2	1	2	9.0	0
7	8.0	2	2	1	2	10	0
7	8.0	2	2	2	1	8.0	0
7	8.0	2	2	2	1	9.0	0
7	8.0	2	2	2	1	10	0
7	8.0	2	2	2	2	8.0	0
7	8.0	2	2	2	2	9.0	0
7	8.0	2	2	2	2	10	0
7	8.0	2	2	3	1	8.0	0
7	8.0	2	2	3	1	9.0	0
7	8.0	2	2	3	1	10	0
7	8.0	2	2	3	2	8.0	0
7	8.0	2	2	3	2	9.0	0
7	8.0	2	2	3	2	10	0
7	8.0	3	1	1	1	8.0	0
7	8.0	3	1	1	1	9.0	0
7	8.0	3	1	1	1	10	0
7	8.0	3	1	1	2	8.0	0
7	8.0	3	1	1	2	9.0	0
7	8.0	3	1	1	2	10	0
7	8.0	3	1	2	1	8.0	0
7	8.0	3	1	2	1	9.0	0
7	8.0	3	1	2	1	10	0
7	8.0	3	1	2	2	8.0	0
7	8.0	3	1	2	2	9.0	0
7	8.0	3	1	2	2	10	0
7	8.0	3	1	3	1	8.0	0
7	8.0	3	1	3	1	9.0	0
7	8.0	3	1	3	1	10	0
7	8.0	3	1	3	2	8.0	0
7	8.0	3	1	3	2	9.0	0
7	8.0	3	1	3	2	10	0
7	8.0	3	2	1	1	8.0	0
7	8.0	3	2	1	1	9.0	0
7	8.0	3	2	1	1	10	0

A	B	C	D	E	F	G	H
7	8.0	3	2	1	2	8.0	0
7	8.0	3	2	1	2	9.0	0
7	8.0	3	2	1	2	10	0
7	8.0	3	2	2	1	8.0	0
7	8.0	3	2	2	1	9.0	0
7	8.0	3	2	2	1	10	0
7	8.0	3	2	2	2	8.0	0
7	8.0	3	2	2	2	9.0	0
7	8.0	3	2	2	2	10	0
7	8.0	3	2	3	1	8.0	0
7	8.0	3	2	3	1	9.0	0
7	8.0	3	2	3	1	10	0
7	8.0	3	2	3	2	8.0	1
7	8.0	3	2	3	2	9.0	0
7	8.0	3	2	3	2	10	0
7	8.0	4	1	1	1	8.0	0
7	8.0	4	1	1	1	9.0	0
7	8.0	4	1	1	1	10	0
7	8.0	4	1	1	2	8.0	0
7	8.0	4	1	1	2	9.0	0
7	8.0	4	1	1	2	10	0
7	8.0	4	1	2	1	8.0	0
7	8.0	4	1	2	1	9.0	0
7	8.0	4	1	2	1	10	0
7	8.0	4	1	2	2	8.0	0
7	8.0	4	1	2	2	9.0	0
7	8.0	4	1	2	2	10	0
7	8.0	4	1	3	1	8.0	0
7	8.0	4	1	3	1	9.0	0
7	8.0	4	1	3	1	10	0
7	8.0	4	1	3	2	8.0	0
7	8.0	4	1	3	2	9.0	0
7	8.0	4	1	3	2	10	0
7	8.0	4	2	1	1	8.0	0
7	8.0	4	2	1	1	9.0	0
7	8.0	4	2	1	1	10	0
7	8.0	4	2	1	2	8.0	0
7	8.0	4	2	1	2	9.0	0
7	8.0	4	2	1	2	10	0
7	8.0	4	2	2	1	8.0	0
7	8.0	4	2	2	1	9.0	0
7	8.0	4	2	2	1	10	0
7	8.0	4	2	2	2	8.0	0
7	8.0	4	2	2	2	9.0	0
7	8.0	4	2	2	2	10	0
7	8.0	4	2	3	1	8.0	0
7	8.0	4	2	3	1	9.0	0
7	8.0	4	2	3	1	10	0
7	8.0	4	2	3	2	8.0	0
7	8.0	4	2	3	2	9.0	0
7	8.0	4	2	3	2	10	0
7	8.0	5	1	1	1	8.0	0
7	8.0	5	1	1	1	9.0	0
7	8.0	5	1	1	1	10	0
7	8.0	5	1	1	2	8.0	0
7	8.0	5	1	1	2	9.0	0
7	8.0	5	1	1	2	10	0
7	8.0	5	1	2	1	8.0	0
7	8.0	5	1	2	1	9.0	0
7	8.0	5	1	2	1	10	0
7	8.0	5	1	2	2	8.0	0
7	8.0	5	1	2	2	9.0	0
7	8.0	5	1	2	2	10	0
7	8.0	5	1	3	1	8.0	0
7	8.0	5	1	3	1	9.0	0
7	8.0	5	1	3	1	10	0

A	B	C	D	E	F	G	H
7	8.0	5	1	3	2	8.0	0
7	8.0	5	1	3	2	9.0	0
7	8.0	5	1	3	2	10	0
7	8.0	5	2	1	1	8.0	0
7	8.0	5	2	1	1	9.0	0
7	8.0	5	2	1	1	10	0
7	8.0	5	2	1	2	8.0	0
7	8.0	5	2	1	2	9.0	0
7	8.0	5	2	1	2	10	0
7	8.0	5	2	2	1	8.0	0
7	8.0	5	2	2	1	9.0	0
7	8.0	5	2	2	1	10	0
7	8.0	5	2	2	2	8.0	0
7	8.0	5	2	2	2	9.0	0
7	8.0	5	2	2	2	10	0
7	8.0	5	2	3	1	8.0	0
7	8.0	5	2	3	1	9.0	0
7	8.0	5	2	3	1	10	0
7	8.0	5	2	3	2	8.0	0
7	8.0	5	2	3	2	9.0	0
7	8.0	5	2	3	2	10	0
7	9.0	1	1	1	1	9.0	9
7	9.0	1	1	1	1	9.5	7
7	9.0	1	1	1	1	10	1
7	9.0	1	1	1	2	9.0	9
7	9.0	1	1	1	2	9.5	9
7	9.0	1	1	1	2	10	2
7	9.0	1	1	2	1	9.0	1
7	9.0	1	1	2	1	9.5	1
7	9.0	1	1	2	1	10	0
7	9.0	1	1	2	2	9.0	1
7	9.0	1	1	2	2	9.5	1
7	9.0	1	1	2	2	10	1
7	9.0	1	1	3	1	9.0	7
7	9.0	1	1	3	1	9.5	6
7	9.0	1	1	3	1	10	1
7	9.0	1	1	3	2	9.0	0
7	9.0	1	1	3	2	9.5	0
7	9.0	1	1	3	2	10	0
7	9.0	1	2	1	1	9.0	0
7	9.0	1	2	1	1	9.5	0
7	9.0	1	2	1	1	10	0
7	9.0	1	2	1	2	9.0	3
7	9.0	1	2	1	2	9.5	3
7	9.0	1	2	1	2	10	1
7	9.0	1	2	2	1	9.0	1
7	9.0	1	2	2	1	9.5	1
7	9.0	1	2	2	1	10	1
7	9.0	1	2	2	2	9.0	2
7	9.0	1	2	2	2	9.5	1
7	9.0	1	2	2	2	10	0
7	9.0	1	2	3	1	9.0	3
7	9.0	1	2	3	1	9.5	2
7	9.0	1	2	3	1	10	0
7	9.0	1	2	3	2	9.0	8
7	9.0	1	2	3	2	9.5	8
7	9.0	1	2	3	2	10	4
7	9.0	2	1	1	1	9.0	25
7	9.0	2	1	1	1	9.5	23
7	9.0	2	1	1	1	10	19
7	9.0	2	1	1	2	9.0	35
7	9.0	2	1	1	2	9.5	34
7	9.0	2	1	1	2	10	27
7	9.0	2	1	2	1	9.0	44
7	9.0	2	1	2	1	9.5	38
7	9.0	2	1	2	1	10	31

A	B	C	D	E	F	G	H
7	9.0	2	1	2	2	9.0	29
7	9.0	2	1	2	2	9.5	24
7	9.0	2	1	2	2	10	12
7	9.0	2	1	3	1	9.0	15
7	9.0	2	1	3	1	9.5	10
7	9.0	2	1	3	1	10	6
7	9.0	2	1	3	2	9.0	29
7	9.0	2	1	3	2	9.5	27
7	9.0	2	1	3	2	10	20
7	9.0	2	2	1	1	9.0	37
7	9.0	2	2	1	1	9.5	34
7	9.0	2	2	1	1	10	9
7	9.0	2	2	1	2	9.0	24
7	9.0	2	2	1	2	9.5	23
7	9.0	2	2	1	2	10	7
7	9.0	2	2	2	1	9.0	32
7	9.0	2	2	2	1	9.5	31
7	9.0	2	2	2	1	10	22
7	9.0	2	2	2	2	9.0	36
7	9.0	2	2	2	2	9.5	34
7	9.0	2	2	2	2	10	14
7	9.0	2	2	3	1	9.0	18
7	9.0	2	2	3	1	9.5	18
7	9.0	2	2	3	1	10	12
7	9.0	2	2	3	2	9.0	9
7	9.0	2	2	3	2	9.5	9
7	9.0	2	2	3	2	10	4
7	9.0	3	1	1	1	9.0	11
7	9.0	3	1	1	1	9.5	10
7	9.0	3	1	1	1	10	7
7	9.0	3	1	1	2	9.0	32
7	9.0	3	1	1	2	9.5	31
7	9.0	3	1	1	2	10	23
7	9.0	3	1	2	1	9.0	27
7	9.0	3	1	2	1	9.5	26
7	9.0	3	1	2	1	10	23
7	9.0	3	1	2	2	9.0	16
7	9.0	3	1	2	2	9.5	14
7	9.0	3	1	2	2	10	13
7	9.0	3	1	3	1	9.0	38
7	9.0	3	1	3	1	9.5	37
7	9.0	3	1	3	1	10	30
7	9.0	3	1	3	2	9.0	31
7	9.0	3	1	3	2	9.5	29
7	9.0	3	1	3	2	10	28
7	9.0	3	2	1	1	9.0	24
7	9.0	3	2	1	1	9.5	22
7	9.0	3	2	1	1	10	13
7	9.0	3	2	1	2	9.0	28
7	9.0	3	2	1	2	9.5	26
7	9.0	3	2	1	2	10	14
7	9.0	3	2	2	1	9.0	29
7	9.0	3	2	2	1	9.5	24
7	9.0	3	2	2	1	10	19
7	9.0	3	2	2	2	9.0	21
7	9.0	3	2	2	2	9.5	21
7	9.0	3	2	2	2	10	19
7	9.0	3	2	3	1	9.0	10
7	9.0	3	2	3	1	9.5	8
7	9.0	3	2	3	1	10	6
7	9.0	3	2	3	2	9.0	18
7	9.0	3	2	3	2	9.5	16
7	9.0	3	2	3	2	10	9
7	9.0	4	1	1	1	9.0	42
7	9.0	4	1	1	1	9.5	36
7	9.0	4	1	1	1	10	28
7	9.0	4	1	1	2	9.0	10
7	9.0	4	1	1	2	9.5	9
7	9.0	4	1	1	2	10	3
7	9.0	4	1	2	1	9.0	11
7	9.0	4	1	2	1	9.5	9
7	9.0	4	1	2	1	10	3
7	9.0	4	1	2	2	9.0	23
7	9.0	4	1	2	2	9.5	18
7	9.0	4	1	2	2	10	5
7	9.0	4	1	3	1	9.0	38
7	9.0	4	1	3	1	9.5	11
7	9.0	4	1	3	1	10	2
7	9.0	4	1	3	2	9.0	13
7	9.0	4	1	3	2	9.5	9
7	9.0	4	1	3	2	10	3
7	9.0	4	2	1	1	9.0	12
7	9.0	4	2	1	1	9.5	9
7	9.0	4	2	1	1	10	5
7	9.0	4	2	1	2	9.0	20
7	9.0	4	2	1	2	9.5	17
7	9.0	4	2	1	2	10	11
7	9.0	4	2	2	1	9.0	21
7	9.0	4	2	2	1	9.5	18
7	9.0	4	2	2	1	10	15
7	9.0	4	2	2	2	9.0	20
7	9.0	4	2	2	2	9.5	17
7	9.0	4	2	2	2	10	11
7	9.0	4	2	3	1	9.0	15
7	9.0	4	2	3	1	9.5	11
7	9.0	4	2	3	1	10	7
7	9.0	4	2	3	2	9.0	21
7	9.0	4	2	3	2	9.5	18
7	9.0	4	2	3	2	10	9
7	9.0	5	1	1	1	9.0	33
7	9.0	5	1	1	1	9.5	22
7	9.0	5	1	1	1	10	7
7	9.0	5	1	1	2	9.0	12
7	9.0	5	1	1	2	9.5	9
7	9.0	5	1	1	2	10	4
7	9.0	5	1	2	1	9.0	10
7	9.0	5	1	2	1	9.5	10
7	9.0	5	1	2	1	10	8
7	9.0	5	1	2	2	9.0	28
7	9.0	5	1	2	2	9.5	24
7	9.0	5	1	2	2	10	16
7	9.0	5	1	3	1	9.0	20
7	9.0	5	1	3	1	9.5	16
7	9.0	5	1	3	1	10	12
7	9.0	5	1	3	2	9.0	27
7	9.0	5	1	3	2	9.5	24
7	9.0	5	1	3	2	10	20
7	9.0	5	2	1	1	9.0	6
7	9.0	5	2	1	1	9.5	1
7	9.0	5	2	1	1	10	0
7	9.0	5	2	1	2	9.0	4
7	9.0	5	2	1	2	9.5	2
7	9.0	5	2	1	2	10	1
7	9.0	5	2	2	1	9.0	32
7	9.0	5	2	2	1	9.5	24
7	9.0	5	2	2	1	10	13
7	9.0	5	2	2	2	9.0	45
7	9.0	5	2	2	2	9.5	34
7	9.0	5	2	2	2	10	27
7	9.0	5	2	3	1	9.0	1
7	9.0	5	2	3	1	9.5	1
7	9.0	5	2	3	1	10	1
7	9.0	5	2	3	2	9.0	4
7	9.0	5	2	3	2	9.5	4
7	9.0	5	2	3	2	10	4
7	9.5	1	1	1	1	9.5	0
7	9.5	1	1	1	1	10	0
7	9.5	1	1	1	2	9.5	0
7	9.5	1	1	1	2	10	0
7	9.5	1	1	2	1	9.5	0
7	9.5	1	1	2	1	10	0
7	9.5	1	1	2	2	9.5	1
7	9.5	1	1	2	2	10	0
7	9.5	1	1	3	1	9.5	0
7	9.5	1	1	3	1	10	0
7	9.5	1	1	3	2	9.5	0
7	9.5	1	1	3	2	10	0
7	9.5	1	2	1	1	9.5	0
7	9.5	1	2	1	1	10	0
7	9.5	1	2	1	2	9.5	0
7	9.5	1	2	1	2	10	0
7	9.5	1	2	2	1	9.5	0
7	9.5	1	2	2	1	10	0
7	9.5	1	2	2	2	9.5	0
7	9.5	1	2	2	2	10	0
7	9.5	1	2	3	1	9.5	0
7	9.5	1	2	3	1	10	0
7	9.5	1	2	3	2	9.5	0
7	9.5	1	2	3	2	10	0
7	9.5	2	1	1	1	9.5	0
7	9.5	2	1	1	1	10	0
7	9.5	2	1	1	2	9.5	0
7	9.5	2	1	1	2	10	0
7	9.5	2	1	2	1	9.5	0
7	9.5	2	1	2	1	10	0
7	9.5	2	1	2	2	9.5	0
7	9.5	2	1	2	2	10	0
7	9.5	2	1	3	1	9.5	0
7	9.5	2	1	3	1	10	0
7	9.5	2	1	3	2	9.5	1
7	9.5	2	1	3	2	10	1
7	9.5	2	2	1	1	9.5	0
7	9.5	2	2	1	1	10	0
7	9.5	2	2	1	2	9.5	0
7	9.5	2	2	1	2	10	0
7	9.5	2	2	2	1	9.5	0
7	9.5	2	2	2	1	10	0
7	9.5	2	2	2	2	9.5	1
7	9.5	2	2	2	2	10	0
7	9.5	2	2	3	1	9.5	0
7	9.5	2	2	3	1	10	0
7	9.5	2	2	3	2	9.5	0
7	9.5	2	2	3	2	10	0
7	9.5	3	1	1	1	9.5	0
7	9.5	3	1	1	1	10	0
7	9.5	3	1	1	2	9.5	3
7	9.5	3	1	1	2	10	0
7	9.5	3	1	2	1	9.5	1
7	9.5	3	1	2	1	10	1
7	9.5	3	1	2	2	9.5	0
7	9.5	3	1	2	2	10	0
7	9.5	3	1	3	1	9.5	0
7	9.5	3	1	3	1	10	0
7	9.5	3	1	3	2	9.5	0
7	9.5	3	1	3	2	10	0
7	9.5	3	2	1	1	9.5	1
7	9.5	3	2	1	1	10	0
7	9.5	3	2	1	2	9.5	2

A	B	C	D	E	F	G	H
7	9.5	3	2	1	2	10	0
7	9.5	3	2	2	1	9.5	1
7	9.5	3	2	2	1	10	1
7	9.5	3	2	2	2	9.5	0
7	9.5	3	2	2	2	10	0
7	9.5	3	2	3	1	9.5	0
7	9.5	3	2	3	1	10	0
7	9.5	3	2	3	2	9.5	0
7	9.5	3	2	3	2	10	0
7	9.5	4	1	1	1	9.5	0
7	9.5	4	1	1	1	10	0
7	9.5	4	1	1	2	9.5	0
7	9.5	4	1	1	2	10	0
7	9.5	4	1	2	1	9.5	0
7	9.5	4	1	2	1	10	0
7	9.5	4	1	2	2	9.5	0
7	9.5	4	1	2	2	10	0
7	9.5	4	1	3	1	9.5	0
7	9.5	4	1	3	1	10	0
7	9.5	4	1	3	2	9.5	0
7	9.5	4	1	3	2	10	0
7	9.5	4	2	1	1	9.5	0
7	9.5	4	2	1	1	10	0
7	9.5	4	2	1	2	9.5	1
7	9.5	4	2	1	2	10	0
7	9.5	4	2	2	1	9.5	0
7	9.5	4	2	2	1	10	0
7	9.5	4	2	2	2	9.5	2
7	9.5	4	2	2	2	10	0
7	9.5	4	2	3	1	9.5	0
7	9.5	4	2	3	1	10	0
7	9.5	4	2	3	2	9.5	1
7	9.5	4	2	3	2	10	0
7	9.5	5	1	1	1	9.5	0
7	9.5	5	1	1	1	10	0
7	9.5	5	1	1	2	9.5	0
7	9.5	5	1	1	2	10	0
7	9.5	5	1	2	1	9.5	0
7	9.5	5	1	2	1	10	0
7	9.5	5	1	2	2	9.5	1
7	9.5	5	1	2	2	10	0
7	9.5	5	1	3	1	9.5	0
7	9.5	5	1	3	1	10	0
7	9.5	5	1	3	2	9.5	0
7	9.5	5	1	3	2	10	0
7	9.5	5	2	1	1	9.5	0
7	9.5	5	2	1	1	10	0
7	9.5	5	2	1	2	9.5	0
7	9.5	5	2	1	2	10	0
7	9.5	5	2	2	1	9.5	0
7	9.5	5	2	2	1	10	0
7	9.5	5	2	2	2	9.5	0
7	9.5	5	2	2	2	10	0
7	9.5	5	2	3	1	9.5	0
7	9.5	5	2	3	1	10	0
7	9.5	5	2	3	2	9.5	0
7	9.5	5	2	3	2	10	0
7	10	1	1	1	1	10	0
7	10	1	1	1	2	10	1
7	10	1	1	2	1	10	0
7	10	1	1	2	2	10	1
7	10	1	1	3	1	10	0
7	10	1	1	3	2	10	4
7	10	1	2	1	1	10	2
7	10	1	2	1	2	10	2
7	10	1	2	2	1	10	4

A	B	C	D	E	F	G	H
7	10	1	2	2	2	10	0
7	10	1	2	3	1	10	0
7	10	1	2	3	2	10	1
7	10	2	1	1	1	10	0
7	10	2	1	1	2	10	0
7	10	2	1	2	1	10	1
7	10	2	1	2	2	10	0
7	10	2	1	3	1	10	1
7	10	2	1	3	2	10	2
7	10	2	2	1	1	10	0
7	10	2	2	1	2	10	0
7	10	2	2	2	1	10	0
7	10	2	2	2	2	10	0
7	10	2	2	3	1	10	0
7	10	2	2	3	2	10	0
7	10	3	1	1	1	10	6
7	10	3	1	1	2	10	3
7	10	3	1	2	1	10	6
7	10	3	1	2	2	10	8
7	10	3	1	3	1	10	7
7	10	3	1	3	2	10	6
7	10	3	2	1	1	10	2
7	10	3	2	1	2	10	1
7	10	3	2	2	1	10	4
7	10	3	2	2	2	10	6
7	10	3	2	3	1	10	3
7	10	3	2	3	2	10	2
7	10	4	1	1	1	10	0
7	10	4	1	1	2	10	0
7	10	4	1	2	1	10	1
7	10	4	1	2	2	10	0
7	10	4	1	3	1	10	0
7	10	4	1	3	2	10	0
7	10	4	2	1	1	10	3
7	10	4	2	1	2	10	2
7	10	4	2	2	1	10	6
7	10	4	2	2	2	10	2
7	10	4	2	3	1	10	2
7	10	4	2	3	2	10	0
7	10	5	1	1	1	10	0
7	10	5	1	1	2	10	2
7	10	5	1	2	1	10	3
7	10	5	1	2	2	10	1
7	10	5	1	3	1	10	2
7	10	5	1	3	2	10	4
7	10	5	2	1	1	10	1
7	10	5	2	1	2	10	2
7	10	5	2	2	1	10	0
7	10	5	2	2	2	10	0
7	10	5	2	3	1	10	1
7	10	5	2	3	2	10	0

Appendix 6 - Table 1

A - Species:
- 1 - *Agropyron dasystachyum*
- 2 - *Agropyron trachycaulum*
- 3 - *Bromus inermis*
- 4 - *Festuca hallii*
- 5 - *Stipa comata*
- 6 - *Stipa curtiseta*
- 7 - *Stipa viridula*
- 8 - *Stipa viridula* (Lodorm)

B - Cohort number

C - Site along topographic gradient (A=ridge, E=toe of slope)

D - Moisture treatment:
- 1 - Control
- 2 - Irrigated

E - Plot (replicate)

F - Subplot (duplicate)

G - Count number:
- 1 - June 5, 1989
- 2 - June 13, 1989
- 3 - June 26, 1989
- 4 - July 4, 1989
- 5 - July 18, 1989
- 6 - July 26, 1989
- 7 - August 10, 1989
- 8 - August 19, 1989 (Survivorship)
- 8 - September 3, 1989 (Germination)
- 9 - May 17, 1990
- 9.5 - May 29, 1990
- 10 - July 26, 1990

H - Germination and subsequent survivorship

Table 1.8. Individual germination and survivorship data for *Stipa viridula* (Lodorm) from field experiment in 1989 and 1990.

A	B	C	D	E	F	G	H
8	1	1	1	1	1	1	8
8	1	1	1	1	1	2	8
8	1	1	1	1	1	3	8
8	1	1	1	1	1	4	8
8	1	1	1	1	1	5	8
8	1	1	1	1	1	6	8
8	1	1	1	1	1	7	8
8	1	1	1	1	1	8	8
8	1	1	1	1	1	9	8
8	1	1	1	1	1	10	8
8	1	1	1	1	2	1	14
8	1	1	1	1	2	2	14
8	1	1	1	1	2	3	14
8	1	1	1	1	2	4	14
8	1	1	1	1	2	5	14
8	1	1	1	1	2	6	14
8	1	1	1	1	2	7	14
8	1	1	1	1	2	8	14
8	1	1	1	1	2	9	14
8	1	1	1	1	2	10	14
8	1	1	1	2	1	1	3
8	1	1	1	2	1	2	3
8	1	1	1	2	1	3	3
8	1	1	1	2	1	4	3
8	1	1	1	2	1	5	3
8	1	1	1	2	1	6	3
8	1	1	1	2	1	7	3
8	1	1	1	2	1	8	3
8	1	1	1	2	1	9	3
8	1	1	1	2	1	10	3
8	1	1	1	2	2	1	6
8	1	1	1	2	2	2	6
8	1	1	1	2	2	3	6
8	1	1	1	2	2	4	5
8	1	1	1	2	2	5	5
8	1	1	1	2	2	6	5
8	1	1	1	2	2	7	5
8	1	1	1	2	2	8	5
8	1	1	1	2	2	9	5
8	1	1	1	2	2	10	5
8	1	1	1	3	1	1	5
8	1	1	1	3	1	2	5
8	1	1	1	3	1	3	5
8	1	1	1	3	1	4	5
8	1	1	1	3	1	5	5
8	1	1	1	3	1	6	5
8	1	1	1	3	1	7	5
8	1	1	1	3	1	8	5
8	1	1	1	3	1	9	5
8	1	1	1	3	1	10	5
8	1	1	1	3	2	1	6
8	1	1	1	3	2	2	6
8	1	1	1	3	2	3	6
8	1	1	1	3	2	4	6
8	1	1	1	3	2	5	6
8	1	1	1	3	2	6	6
8	1	1	1	3	2	7	6
8	1	1	1	3	2	8	6
8	1	1	1	3	2	9	6
8	1	1	1	3	2	10	6
8	1	1	2	1	1	1	13
8	1	1	2	1	1	2	13
8	1	1	2	1	1	3	13
8	1	1	2	1	1	4	13
8	1	1	2	1	1	5	13
8	1	1	2	1	1	6	13
8	1	1	2	1	1	7	12
8	1	1	2	1	1	8	12
8	1	1	2	1	1	9	12
8	1	1	2	1	1	10	12
8	1	1	2	1	2	1	25
8	1	1	2	1	2	2	25
8	1	1	2	1	2	3	25
8	1	1	2	1	2	4	25
8	1	1	2	1	2	5	25
8	1	1	2	1	2	6	25
8	1	1	2	1	2	7	25
8	1	1	2	1	2	8	25
8	1	1	2	1	2	9	
8	1	1	2	1	2	10	25
8	1	1	2	2	1	1	16
8	1	1	2	2	1	2	16
8	1	1	2	2	1	3	16
8	1	1	2	2	1	4	14
8	1	1	2	2	1	5	14
8	1	1	2	2	1	6	14
8	1	1	2	2	1	7	14
8	1	1	2	2	1	8	14
8	1	1	2	2	1	9	14
8	1	1	2	2	1	10	14
8	1	1	2	2	2	1	21
8	1	1	2	2	2	2	21
8	1	1	2	2	2	3	21
8	1	1	2	2	2	4	21
8	1	1	2	2	2	5	21
8	1	1	2	2	2	6	21
8	1	1	2	2	2	7	21
8	1	1	2	2	2	8	21
8	1	1	2	2	2	9	21
8	1	1	2	2	2	10	21
8	1	1	2	3	1	1	12
8	1	1	2	3	1	2	12
8	1	1	2	3	1	3	12
8	1	1	2	3	1	4	12
8	1	1	2	3	1	5	12
8	1	1	2	3	1	6	12
8	1	1	2	3	1	7	12
8	1	1	2	3	1	8	12
8	1	1	2	3	1	9	12
8	1	1	2	3	1	10	12
8	1	1	2	3	2	1	24
8	1	1	2	3	2	2	24
8	1	1	2	3	2	3	22
8	1	1	2	3	2	4	21
8	1	1	2	3	2	5	20
8	1	1	2	3	2	6	20
8	1	1	2	3	2	7	20
8	1	1	2	3	2	8	20
8	1	1	2	3	2	9	
8	1	1	2	3	2	10	20
8	1	2	1	1	1	1	14
8	1	2	1	1	1	2	14
8	1	2	1	1	1	3	14
8	1	2	1	1	1	4	14
8	1	2	1	1	1	5	14
8	1	2	1	1	1	6	14
8	1	2	1	1	1	7	14
8	1	2	1	1	1	8	14
8	1	2	1	1	1	9	
8	1	2	1	1	1	10	14
8	1	2	1	1	2	1	24
8	1	2	1	1	2	2	24
8	1	2	1	1	2	3	24
8	1	2	1	1	2	4	24
8	1	2	1	1	2	5	24
8	1	2	1	1	2	6	24
8	1	2	1	1	2	7	24
8	1	2	1	1	2	8	24
8	1	2	1	1	2	9	
8	1	2	1	1	2	10	24
8	1	2	1	2	1	1	17
8	1	2	1	2	1	2	17
8	1	2	1	2	1	3	17
8	1	2	1	2	1	4	17
8	1	2	1	2	1	5	17
8	1	2	1	2	1	6	17
8	1	2	1	2	1	7	17
8	1	2	1	2	1	8	17
8	1	2	1	2	1	9	
8	1	2	1	2	1	10	17
8	1	2	1	2	2	1	22
8	1	2	1	2	2	2	21
8	1	2	1	2	2	3	21
8	1	2	1	2	2	4	21
8	1	2	1	2	2	5	21
8	1	2	1	2	2	6	21
8	1	2	1	2	2	7	21
8	1	2	1	2	2	8	21
8	1	2	1	2	2	9	
8	1	2	1	2	2	10	21
8	1	2	1	3	1	1	19
8	1	2	1	3	1	2	19
8	1	2	1	3	1	3	15
8	1	2	1	3	1	4	13
8	1	2	1	3	1	5	13
8	1	2	1	3	1	6	13
8	1	2	1	3	1	7	13
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8	8	3	1	1	1	10	0
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8	8	3	1	1	2	9	0
8	8	3	1	1	2	10	0
8	8	3	1	2	1	8	0
8	8	3	1	2	1	9	0
8	8	3	1	2	1	10	0
8	8	3	1	2	2	8	0
8	8	3	1	2	2	9	0
8	8	3	1	2	2	10	0
8	8	3	1	3	1	8	1
8	8	3	1	3	1	9	1
8	8	3	1	3	1	10	1
8	8	3	1	3	2	8	0
8	8	3	1	3	2	9	0
8	8	3	1	3	2	10	0
8	8	3	2	1	1	8	0
8	8	3	2	1	1	9	0
8	8	3	2	1	1	10	0

A	B	C	D	E	F	G	H
8	8	3	2	1	2	8	0
8	8	3	2	1	2	9	0
8	8	3	2	1	2	10	0
8	8	3	2	2	1	8	0
8	8	3	2	2	1	9	0
8	8	3	2	2	1	10	0
8	8	3	2	2	2	8	0
8	8	3	2	2	2	9	0
8	8	3	2	2	2	10	0
8	8	3	2	3	1	8	0
8	8	3	2	3	1	9	0
8	8	3	2	3	1	10	0
8	8	3	2	3	2	8	0
8	8	3	2	3	2	9	0
8	8	3	2	3	2	10	0
8	8	4	1	1	1	8	0
8	8	4	1	1	1	9	0
8	8	4	1	1	1	10	0
8	8	4	1	1	2	8	0
8	8	4	1	1	2	9	0
8	8	4	1	1	2	10	0
8	8	4	1	2	1	8	0
8	8	4	1	2	1	9	0
8	8	4	1	2	1	10	0
8	8	4	1	2	2	8	0
8	8	4	1	2	2	9	0
8	8	4	1	2	2	10	0
8	8	4	1	3	1	8	0
8	8	4	1	3	1	9	0
8	8	4	1	3	1	10	0
8	8	4	1	3	2	8	0
8	8	4	1	3	2	9	0
8	8	4	1	3	2	10	0
8	8	4	2	1	1	8	0
8	8	4	2	1	1	9	0
8	8	4	2	1	1	10	0
8	8	4	2	1	2	8	0
8	8	4	2	1	2	9	0
8	8	4	2	1	2	10	0
8	8	4	2	2	1	8	0
8	8	4	2	2	1	9	0
8	8	4	2	2	1	10	0
8	8	4	2	2	2	8	0
8	8	4	2	2	2	9	0
8	8	4	2	2	2	10	0
8	8	4	2	3	1	8	0
8	8	4	2	3	1	9	0
8	8	4	2	3	1	10	0
8	8	4	2	3	2	8	0
8	8	4	2	3	2	9	0
8	8	4	2	3	2	10	0
8	8	5	1	1	1	8	0
8	8	5	1	1	1	9	0
8	8	5	1	1	1	10	0
8	8	5	1	1	2	8	0
8	8	5	1	1	2	9	0
8	8	5	1	1	2	10	0
8	8	5	1	2	1	8	0
8	8	5	1	2	1	9	0
8	8	5	1	2	1	10	0
8	8	5	1	2	2	8	0
8	8	5	1	2	2	9	0
8	8	5	1	2	2	10	0
8	8	5	1	3	1	8	0
8	8	5	1	3	1	9	0
8	8	5	1	3	1	10	0

A	B	C	D	E	F	G	H
8	8	5	1	3	2	8	0
8	8	5	1	3	2	9	0
8	8	5	1	3	2	10	0
8	8	5	2	1	1	8	0
8	8	5	2	1	1	9	0
8	8	5	2	1	1	10	0
8	8	5	2	1	2	8	0
8	8	5	2	1	2	9	0
8	8	5	2	1	2	10	0
8	8	5	2	2	1	8	0
8	8	5	2	2	1	9	0
8	8	5	2	2	1	10	0
8	8	5	2	2	2	8	0
8	8	5	2	2	2	9	0
8	8	5	2	2	2	10	0
8	8	5	2	3	1	8	0
8	8	5	2	3	1	9	0
8	8	5	2	3	1	10	0
8	8	5	2	3	2	8	0
8	8	5	2	3	2	9	0
8	8	5	2	3	2	10	0

Appendix 6 - Table 1

A - Species:
- 1 - *Agropyron dasystachyum*
- 2 - *Agropyron trachycaulum*
- 3 - *Bromus inermis*
- 4 - *Festuca hallii*
- 5 - *Stipa comata*
- 6 - *Stipa curtiseta*
- 7 - *Stipa viridula*
- 8 - *Stipa viridula* (Lodorm)

B - Cohort number

C - Site along topographic gradient (A=ridge, E=toe of slope)

D - Moisture treatment:
- 1 - Control
- 2 - Irrigated

E - Plot (replicate)

F - Subplot (duplicate)

G - Count number:
- 1 - June 5, 1989
- 2 - June 13, 1989
- 3 - June 26, 1989
- 4 - July 4, 1989
- 5 - July 18, 1989
- 6 - July 26, 1989
- 7 - August 10, 1989
- 8 - August 19, 1989 (Survivorship)
- 8 - September 3, 1989 (Germination)
- 9 - May 17, 1990
- 9.5 - May 29, 1990
- 10 - July 26, 1990

H - Germination and subsequent survivorship

Appendix 6 - Table 2

A - Species:
- 1 - *Agropyron dasystachyum*
- 2 - *Agropyron trachycaulum*
- 3 - *Bromus inermis*
- 4 - *Festuca hallii*
- 5 - *Stipa comata*
- 6 - *Stipa curtiseta*
- 7 - *Stipa viridula*
- 8 - *Stipa viridula* (Lodorm)

B - Site along the topographic gradient (1=ridge, 5=toe of slope)

C - Moisture Treatment
- 1 - Control
- 2 - Irrigated

D - Replicate Number

E - Sample Number

F - Cohort Number (germination date)
- 1 - June 5, 1989
- 2 - June 13, 1989
- 3 - June 26, 1989
- 4 - July 4, 1989
- 5 - July 18, 1989
- 6 - July 26, 1989
- 7 - August 10, 1989
- 8 - August 19, 1989 (Survivorship)
- 8 - September 3, 1989 (Germination)

G - Cohort Weighting (growing days after day 0 - June 5, 1989)

H - Number of Tillers/Individual

I - Number of Flowering Culms/Individual

J - Dry Weight (g)

Table 2. Individual data from field experiment including biomass, tiller, and flowering culm data from 1989.

A	B	C	D	E	F	G	H	I	J
1	1	1	1	1	1	0	1	0	0.200
1	1	1	1	2	1	0	6	0	0.336
1	1	1	1	3	1	0	1	0	0.009
1	1	1	1	4	1	0	6	0	0.159
1	1	1	1	5	1	0	4	0	0.106
1	1	1	1	6	1	0	3	0	0.073
1	1	1	1	7	1	0	1	0	0.031
1	1	1	1	8	1	0	4	0	0.149
1	1	1	1	9	1	0	6	0	0.200
1	1	1	1	10	1	0	4	0	0.096
1	1	1	1	11	1	0	7	0	0.191
1	1	1	1	12	1	0	6	0	0.272
1	1	1	1	13	1	0	5	0	0.127
1	1	1	1	14	1	0	3	0	0.058
1	1	1	1	15	1	0	1	0	0.020
1	1	1	1	16	1	0	4	0	0.055
1	1	1	1	17	1	0	1	0	0.012
1	1	1	1	18	1	0	6	0	0.318
1	1	1	1	19	1	0	6	0	0.205
1	1	1	1	20	1	0	5	0	0.101
1	1	1	2	1	1	0	4	0	0.097
1	1	1	2	2	1	0	5	0	0.048
1	1	1	2	3	1	0	7	0	0.109
1	1	1	2	4	1	0	8	0	0.207
1	1	1	2	5	1	0	1	0	0.016
1	1	1	2	6	1	0	1	0	0.037
1	1	1	2	7	1	0	1	0	0.004
1	1	1	2	8	1	0	1	0	0.028
1	1	1	2	9	1	0	3	0	0.044
1	1	1	2	10	1	0	12	0	0.260
1	1	1	2	11	1	0	7	0	0.109
1	1	1	2	12	1	0	14	0	0.437
1	1	1	2	13	1	0	4	0	0.087
1	1	1	2	14	1	0	2	0	0.056
1	1	1	2	15	1	0	17	0	0.454
1	1	1	2	16	1	0	14	0	0.024
1	1	1	2	17	1	0	9	0	0.155
1	1	1	2	18	1	0	5	0	0.174
1	1	1	2	19	1	0	1	0	0.021
1	1	1	2	20	1	0	8	0	0.153
1	1	1	3	1	1	0	7	0	0.102
1	1	1	3	2	1	0	1	0	0.031
1	1	1	3	3	1	0	9	0	0.086
1	1	1	3	4	1	0	6	0	0.096
1	1	1	3	5	1	0	4	0	0.092
1	1	1	3	6	1	0	1	0	0.013
1	1	1	3	7	1	0	2	0	0.063
1	1	1	3	8	1	0	1	0	0.006
1	1	1	3	9	1	0	5	0	0.086
1	1	1	3	10	1	0	2	0	0.106
1	1	1	3	11	1	0	3	0	0.091
1	1	1	3	12	1	0	8	0	0.193
1	1	1	3	13	1	0	1	0	0.028
1	1	1	3	14	1	0	3	0	0.044
1	1	1	3	15	1	0	3	0	0.103
1	1	1	3	16	1	0	3	0	0.137
1	1	1	3	17	1	0	4	0	0.091
1	1	1	3	18	1	0	4	0	0.103
1	1	1	3	19	1	0	1	0	0.018
1	1	1	3	20	1	0	6	0	0.161
1	1	2	1	1	1	0	4	0	0.198
1	1	2	1	2	1	0	1	0	0.049
1	1	2	1	3	1	0	8	0	0.371
1	1	2	1	4	1	0	3	0	0.111
1	1	2	1	5	1	0	9	0	0.310
1	1	2	1	6	1	0	3	0	0.074
1	1	2	1	7	1	0	4	0	0.284
1	1	2	1	8	1	0	9	0	0.360
1	1	2	1	9	1	0	9	0	0.357
1	1	2	1	10	1	0	10	0	0.555
1	1	2	1	11	1	0	2	0	0.106
1	1	2	1	12	1	0	4	0	0.175
1	1	2	1	13	1	0	4	0	0.135
1	1	2	1	14	1	0	5	0	0.209
1	1	2	1	15	1	0	5	0	0.174
1	1	2	1	16	1	0	3	0	0.093
1	1	2	1	17	1	0	6	0	0.279
1	1	2	1	18	1	0	9	0	0.324
1	1	2	1	19	1	0	2	0	0.097
1	1	2	1	20	1	0	12	0	0.659
1	1	2	2	1	1	0	6	0	0.065
1	1	2	2	2	1	0	2	0	0.040
1	1	2	2	3	1	0	9	0	0.241
1	1	2	2	4	1	0	16	0	0.609
1	1	2	2	5	1	0	5	0	0.432
1	1	2	2	6	1	0	4	0	0.160
1	1	2	2	7	1	0	16	0	0.633
1	1	2	2	8	1	0	1	0	0.051
1	1	2	2	9	1	0	1	0	0.046
1	1	2	2	10	1	0	6	0	0.130
1	1	2	2	11	1	0	4	0	0.120
1	1	2	2	12	1	0	4	0	0.283
1	1	2	2	13	1	0	4	0	0.228
1	1	2	2	14	1	0	7	0	0.221
1	1	2	2	15	1	0	9	0	0.302
1	1	2	2	16	1	0	5	0	0.333
1	1	2	2	17	1	0	4	0	0.142
1	1	2	2	18	1	0	11	0	0.460
1	1	2	2	19	1	0	3	0	0.061
1	1	2	2	20	1	0	5	0	0.213
1	1	2	3	1	1	0	3	0	0.084
1	1	2	3	2	1	0	16	0	0.466
1	1	2	3	3	1	0	4	0	0.117
1	1	2	3	4	1	0	2	0	0.087
1	1	2	3	5	1	0	5	0	0.059
1	1	2	3	6	1	0	2	0	0.041
1	1	2	3	7	1	0	3	0	0.082
1	1	2	3	8	1	0	7	0	0.238
1	1	2	3	9	1	0	12	0	0.217
1	1	2	3	10	1	0	4	0	0.149
1	1	2	3	11	1	0	7	0	0.231
1	1	2	3	12	1	0	2	0	0.050
1	1	2	3	13	1	0	4	0	0.121
1	1	2	3	14	1	0	7	0	0.192
1	1	2	3	15	1	0	4	0	0.139
1	1	2	3	16	1	0	6	0	0.114
1	1	2	3	17	1	0	11	0	0.409
1	1	2	3	18	1	0	4	0	0.138
1	1	2	3	19	1	0	1	0	0.017
1	1	2	3	20	1	0	4	0	0.069
1	2	1	1	1	1	0	4	0	0.160
1	2	1	1	2	1	0	5	0	0.197
1	2	1	1	3	1	0	5	0	0.112
1	2	1	1	4	1	0	5	0	0.101
1	2	1	1	5	1	0	3	0	0.094
1	2	1	1	6	1	0	2	0	0.044
1	2	1	1	7	1	0	6	0	0.185
1	2	1	1	8	1	0	3	0	0.132
1	2	1	1	9	1	0	4	0	0.173

A	B	C	D	E	F	G	H	I	J
1	2	1	1	10	1	0	5	0	0.197
1	2	1	1	11	1	0	2	0	0.089
1	2	1	1	12	1	0	4	0	0.073
1	2	1	1	13	1	0	5	0	0.175
1	2	1	1	14	1	0	5	0	0.260
1	2	1	1	15	1	0	5	0	0.179
1	2	1	1	16	1	0	5	0	0.159
1	2	1	1	17	1	0	8	0	0.272
1	2	1	1	18	1	0	5	0	0.131
1	2	1	1	19	1	0	5	0	0.162
1	2	1	1	20	1	0	1	0	0.025
1	2	1	2	1	1	0	3	0	0.079
1	2	1	2	2	1	0	5	0	0.199
1	2	1	2	3	1	0	6	0	0.207
1	2	1	2	4	1	0	4	0	0.141
1	2	1	2	5	1	0	1	0	0.045
1	2	1	2	6	1	0	5	0	0.138
1	2	1	2	7	1	0	4	0	0.079
1	2	1	2	8	1	0	3	0	0.136
1	2	1	2	9	1	0	2	0	0.025
1	2	1	2	10	1	0	4	0	0.139
1	2	1	2	11	1	0	3	0	0.091
1	2	1	2	12	1	0	3	0	0.097
1	2	1	2	13	1	0	4	0	0.085
1	2	1	2	14	1	0	1	0	0.022
1	2	1	2	15	1	0	1	0	0.041
1	2	1	2	16	1	0	2	0	0.023
1	2	1	2	17	1	0	4	0	0.114
1	2	1	2	18	1	0	7	0	0.184
1	2	1	2	19	1	0	5	0	0.186
1	2	1	2	20	1	0	3	0	0.072
1	2	1	3	1	1	0	5	0	0.282
1	2	1	3	2	1	0	2	0	0.057
1	2	1	3	3	1	0	8	0	0.227
1	2	1	3	4	1	0	5	0	0.225
1	2	1	3	5	1	0	4	0	0.164
1	2	1	3	6	1	0	5	0	0.099
1	2	1	3	7	1	0	5	0	0.200
1	2	1	3	8	1	0	4	0	0.115
1	2	1	3	9	1	0	6	0	0.167
1	2	1	3	10	1	0	5	0	0.194
1	2	1	3	11	1	0	4	0	0.150
1	2	1	3	12	1	0	6	0	0.131
1	2	1	3	13	1	0	10	0	0.277
1	2	1	3	14	1	0	3	0	0.039
1	2	1	3	15	1	0	7	0	0.227
1	2	1	3	16	1	0	3	0	0.113
1	2	1	3	17	1	0	4	0	0.222
1	2	1	3	18	1	0	7	0	0.171
1	2	1	3	19	1	0	11	0	0.474
1	2	1	3	20	1	0	1	0	0.031
1	2	2	1	1	1	0	13	0	0.436
1	2	2	1	2	1	0	13	0	0.411
1	2	2	1	3	1	0	9	0	0.279
1	2	2	1	4	1	0	9	0	0.475
1	2	2	1	5	1	0	9	0	0.328
1	2	2	1	6	1	0	6	0	0.125
1	2	2	1	7	1	0	9	0	0.440
1	2	2	1	8	1	0	5	0	0.241
1	2	2	1	9	1	0	6	0	0.315
1	2	2	1	10	1	0	3	0	0.136
1	2	2	1	11	1	0	3	0	0.046
1	2	2	1	12	1	0	6	0	0.249
1	2	2	1	13	1	0	6	0	0.289
1	2	2	1	14	1	0	6	0	0.189
1	2	2	1	15	1	0	8	0	0.364
1	2	2	1	16	1	0	8	0	0.198
1	2	2	1	17	1	0	6	0	0.200
1	2	2	1	18	1	0	7	0	0.286
1	2	2	1	19	1	0	10	0	0.346
1	2	2	1	20	1	0	9	0	0.151
1	2	2	2	1	1	0	4	0	0.113
1	2	2	2	2	1	0	6	0	0.269
1	2	2	2	3	1	0	8	0	0.326
1	2	2	2	4	1	0	6	0	0.314
1	2	2	2	5	1	0	4	0	0.103
1	2	2	2	6	1	0	5	0	0.250
1	2	2	2	7	1	0	7	0	0.371
1	2	2	2	8	1	0	1	0	0.077
1	2	2	2	9	1	0	5	0	0.387
1	2	2	2	10	1	0	1	0	0.030
1	2	2	2	11	1	0	6	0	0.293
1	2	2	2	12	1	0	4	0	0.190
1	2	2	2	13	1	0	4	0	0.148
1	2	2	2	14	1	0	8	0	0.510
1	2	2	2	15	1	0	18	0	0.912
1	2	2	2	16	1	0	2	0	0.131
1	2	2	2	17	1	0	6	0	0.402
1	2	2	2	18	1	0	10	0	0.537
1	2	2	2	19	1	0	11	0	0.479
1	2	2	2	20	1	0	2	0	0.108
1	2	2	3	1	1	0	15	0	0.401
1	2	2	3	2	1	0	10	0	0.524
1	2	2	3	3	1	0	5	0	0.413
1	2	2	3	4	1	0	4	0	0.198
1	2	2	3	5	1	0	2	0	0.062
1	2	2	3	6	1	0	9	0	0.565
1	2	2	3	7	1	0	2	0	0.165
1	2	2	3	8	1	0	4	0	0.131
1	2	2	3	9	1	0	10	0	0.360
1	2	2	3	10	1	0	4	0	0.179
1	2	2	3	11	1	0	2	0	0.122
1	2	2	3	12	1	0	2	0	0.076
1	2	2	3	13	1	0	3	0	0.074
1	2	2	3	14	1	0	10	0	0.236
1	2	2	3	15	1	0	5	0	0.213
1	2	2	3	16	1	0	11	0	0.777
1	2	2	3	17	1	0	4	0	0.119
1	2	2	3	18	1	0	7	0	0.252
1	2	2	3	19	1	0	6	0	0.211
1	2	2	3	20	1	0	7	0	0.314
1	3	1	1	1	1	0	8	0	0.151
1	3	1	1	2	1	0	6	0	0.094
1	3	1	1	3	1	0	9	0	0.275
1	3	1	1	4	1	0	1	0	0.034
1	3	1	1	5	1	0	17	0	0.588
1	3	1	1	6	1	0	13	0	0.524
1	3	1	1	7	1	0	17	0	0.664
1	3	1	1	8	1	0	7	0	0.170
1	3	1	1	9	1	0	7	0	0.207
1	3	1	1	10	1	0	12	0	0.412
1	3	1	1	11	1	0	17	0	0.780
1	3	1	1	12	1	0	13	0	0.507
1	3	1	1	13	1	0	11	0	0.525
1	3	1	1	14	1	0	14	0	0.516
1	3	1	1	15	1	0	5	0	0.094
1	3	1	1	16	1	0	6	0	0.326
1	3	1	1	17	1	0	24	0	0.812
1	3	1	1	18	1	0	27	0	0.776
1	3	1	1	19	1	0	7	0	0.170
1	3	1	1	20	1	0	4	0	0.088
1	3	1	2	1	1	0	13	0	0.385

A	B	C	D	E	F	G	H	I	J
1	3	1	2	2	1	0	13	0	0.448
1	3	1	2	3	1	0	3	0	0.084
1	3	1	2	4	1	0	3	0	0.060
1	3	1	2	5	1	0	10	0	0.580
1	3	1	2	6	1	0	8	0	0.377
1	3	1	2	7	1	0	10	0	0.166
1	3	1	2	8	1	0	2	0	0.082
1	3	1	2	9	1	0	14	0	0.569
1	3	1	2	10	1	0	8	0	0.150
1	3	1	2	11	1	0	9	0	0.466
1	3	1	2	12	1	0	13	0	0.448
1	3	1	2	13	1	0	12	0	0.299
1	3	1	2	14	1	0	13	0	0.347
1	3	1	2	15	1	0	9	0	0.248
1	3	1	2	16	1	0	3	0	0.064
1	3	1	2	17	1	0	12	0	0.438
1	3	1	2	18	1	0	14	0	0.099
1	3	1	2	19	1	0	4	0	0.101
1	3	1	2	20	1	0	2	0	0.589
1	3	1	3	1	1	0	9	0	0.381
1	3	1	3	2	1	0	11	0	0.393
1	3	1	3	3	1	0	3	0	0.086
1	3	1	3	4	1	0	2	0	0.055
1	3	1	3	5	1	0	3	0	0.047
1	3	1	3	6	1	0	2	0	0.028
1	3	1	3	7	1	0	4	0	0.140
1	3	1	3	8	1	0	5	0	0.172
1	3	1	3	9	1	0	6	0	0.268
1	3	1	3	10	1	0	10	0	0.227
1	3	1	3	11	1	0	5	0	0.157
1	3	1	3	12	1	0	2	0	0.022
1	3	1	3	13	1	0	4	0	0.119
1	3	1	3	14	1	0	3	0	0.102
1	3	1	3	15	1	0	5	0	0.093
1	3	1	3	16	1	0	7	0	0.254
1	3	1	3	17	1	0	3	0	0.068
1	3	1	3	18	1	0	11	0	0.305
1	3	1	3	19	1	0	3	0	0.061
1	3	1	3	20	1	0	8	0	0.132
1	3	2	1	1	1	0	23	0	0.974
1	3	2	1	2	1	0	3	0	0.065
1	3	2	1	3	1	0	4	0	0.114
1	3	2	1	4	1	0	12	0	0.339
1	3	2	1	5	1	0	3	0	0.078
1	3	2	1	6	1	0	4	0	0.079
1	3	2	1	7	1	0	7	0	0.234
1	3	2	1	8	1	0	8	0	0.291
1	3	2	1	9	1	0	8	0	0.446
1	3	2	1	10	1	0	14	0	0.528
1	3	2	1	11	1	0	3	0	0.111
1	3	2	1	12	1	0	10	0	0.348
1	3	2	1	13	1	0	1	0	0.070
1	3	2	1	14	1	0	5	0	0.261
1	3	2	1	15	1	0	7	0	0.222
1	3	2	1	16	1	0	9	0	0.262
1	3	2	1	17	1	0	4	0	0.177
1	3	2	1	18	1	0	6	0	0.135
1	3	2	1	19	1	0	8	0	0.248
1	3	2	1	20	1	0	11	0	0.285
1	3	2	2	1	1	0	4	0	0.303
1	3	2	2	2	1	0	5	0	0.493
1	3	2	2	3	1	0	10	0	0.538
1	3	2	2	4	1	0	5	0	0.225
1	3	2	2	5	1	0	6	0	0.216
1	3	2	2	6	1	0	3	0	0.144
1	3	2	2	7	1	0	5	0	0.078

A	B	C	D	E	F	G	H	I	J
1	3	2	2	8	1	0	6	1	0.395
1	3	2	2	9	1	0	4	0	0.363
1	3	2	2	10	1	0	7	0	0.311
1	3	2	2	11	1	0	12	0	0.773
1	3	2	2	12	1	0	1	0	0.015
1	3	2	2	13	1	0	4	0	0.105
1	3	2	2	14	1	0	19	0	0.797
1	3	2	2	15	1	0	4	0	0.276
1	3	2	2	16	1	0	5	0	0.202
1	3	2	2	17	1	0	1	0	0.049
1	3	2	2	18	1	0	4	0	0.194
1	3	2	2	19	1	0	6	0	0.099
1	3	2	2	20	1	0	10	0	0.635
1	3	2	3	1	1	0	3	0	0.079
1	3	2	3	2	1	0	4	0	0.103
1	3	2	3	3	1	0	6	0	0.160
1	3	2	3	4	1	0	6	0	0.256
1	3	2	3	5	1	0	10	0	0.264
1	3	2	3	6	1	0	6	0	0.236
1	3	2	3	7	1	0	3	0	0.055
1	3	2	3	8	1	0	2	0	0.090
1	3	2	3	9	1	0	2	0	0.126
1	3	2	3	10	1	0	10	0	0.214
1	3	2	3	11	1	0	7	0	0.234
1	3	2	3	12	1	0	15	0	0.410
1	3	2	3	13	1	0	8	0	0.172
1	3	2	3	14	1	0	1	0	0.025
1	3	2	3	15	1	0	9	0	1.077
1	3	2	3	16	1	0	3	0	0.087
1	3	2	3	17	1	0	3	0	0.100
1	3	2	3	18	1	0	8	0	0.296
1	3	2	3	19	1	0	3	0	0.049
1	3	2	3	20	1	0	18	0	0.431
1	4	1	1	1	1	0	7	0	0.237
1	4	1	1	2	1	0	13	0	0.724
1	4	1	1	3	1	0	30	0	1.279
1	4	1	1	4	1	0	13	0	0.448
1	4	1	1	5	1	0	22	0	1.127
1	4	1	1	6	1	0	1	0	0.017
1	4	1	1	7	1	0	12	0	0.488
1	4	1	1	8	1	0	8	0	0.465
1	4	1	1	9	1	0	6	0	0.203
1	4	1	1	10	1	0	14	0	0.822
1	4	1	1	11	1	0	7	0	0.312
1	4	1	1	12	1	0	3	0	0.284
1	4	1	1	13	1	0	3	0	0.065
1	4	1	1	14	1	0	9	0	0.282
1	4	1	1	15	1	0	5	0	0.166
1	4	1	1	16	1	0	11	0	0.513
1	4	1	1	17	1	0	5	0	0.180
1	4	1	1	18	1	0	8	0	0.214
1	4	1	1	19	1	0	9	0	0.497
1	4	1	1	20	1	0	10	0	0.360
1	4	1	2	1	1	0	5	0	0.359
1	4	1	2	2	1	0	21	0	0.970
1	4	1	2	3	1	0	14	0	0.477
1	4	1	2	4	1	0	6	0	0.393
1	4	1	2	5	1	0	7	0	0.265
1	4	1	2	6	1	0	7	0	0.525
1	4	1	2	7	1	0	18	0	0.642
1	4	1	2	8	1	0	6	0	0.226
1	4	1	2	9	1	0	15	0	0.599
1	4	1	2	10	1	0	14	0	0.674
1	4	1	2	11	1	0	5	0	0.276
1	4	1	2	12	1	0	13	0	0.481
1	4	1	2	13	1	0	7	0	0.331

A	B	C	D	E	F	G	H	I	J
1	4	1	2	14	1	0	5	0	0.271
1	4	1	2	15	1	0	16	0	0.834
1	4	1	2	16	1	0	13	0	0.628
1	4	1	2	17	1	0	1	0	0.035
1	4	1	2	18	1	0	34	0	2.033
1	4	1	2	19	1	0	9	0	0.630
1	4	1	2	20	1	0	12	0	0.711
1	4	1	3	1	1	0	24	0	0.701
1	4	1	3	2	1	0	8	0	0.212
1	4	1	3	3	1	0	8	0	0.204
1	4	1	3	4	1	0	12	0	0.498
1	4	1	3	5	1	0	15	0	0.351
1	4	1	3	6	1	0	4	0	0.235
1	4	1	3	7	1	0	4	0	0.116
1	4	1	3	8	1	0	8	0	0.296
1	4	1	3	9	1	0	8	0	0.360
1	4	1	3	10	1	0	5	0	0.348
1	4	1	3	11	1	0	8	0	0.332
1	4	1	3	12	1	0	2	0	0.038
1	4	1	3	13	1	0	7	0	0.189
1	4	1	3	14	1	0	7	0	0.299
1	4	1	3	15	1	0	1	0	0.035
1	4	1	3	16	1	0	1	0	0.040
1	4	1	3	17	1	0	8	0	0.392
1	4	1	3	18	1	0	6	0	0.207
1	4	1	3	19	1	0	7	0	0.196
1	4	1	3	20	1	0	9	0	0.521
1	4	2	1	1	1	0	47	0	1.641
1	4	2	1	2	1	0	2	0	0.057
1	4	2	1	3	1	0	2	0	0.053
1	4	2	1	4	1	0	4	0	0.061
1	4	2	1	5	1	0	6	0	0.488
1	4	2	1	6	1	0	5	0	0.169
1	4	2	1	7	1	0	2	0	0.128
1	4	2	1	8	1	0	5	0	0.529
1	4	2	1	9	1	0	7	0	0.295
1	4	2	1	10	1	0	3	0	0.088
1	4	2	1	11	1	0	8	0	0.283
1	4	2	1	12	1	0	1	0	0.023
1	4	2	1	13	1	0	19	0	0.854
1	4	2	1	14	1	0	13	0	0.505
1	4	2	1	15	1	0	8	0	0.753
1	4	2	1	16	1	0	4	0	0.100
1	4	2	1	17	1	0	2	0	0.077
1	4	2	1	18	1	0	22	0	1.168
1	4	2	1	19	1	0	22	0	1.236
1	4	2	1	20	1	0	14	0	0.966
1	4	2	2	1	1	0	14	0	0.604
1	4	2	2	2	1	0	8	0	0.358
1	4	2	2	3	1	0	4	0	0.110
1	4	2	2	4	1	0	14	0	0.818
1	4	2	2	5	1	0	6	0	0.364
1	4	2	2	6	1	0	10	0	0.398
1	4	2	2	7	1	0	3	0	0.214
1	4	2	2	8	1	0	9	0	0.535
1	4	2	2	9	1	0	14	0	0.561
1	4	2	2	10	1	0	14	0	0.599
1	4	2	2	11	1	0	16	0	0.549
1	4	2	2	12	1	0	28	0	1.306
1	4	2	2	13	1	0	43	0	2.421
1	4	2	2	14	1	0	11	0	0.895
1	4	2	2	15	1	0	12	0	0.446
1	4	2	2	16	1	0	31	0	0.120
1	4	2	2	17	1	0	7	0	0.601
1	4	2	2	18	1	0	15	0	0.784
1	4	2	2	19	1	0	18	0	0.888
1	4	2	2	20	1	0	10	0	0.204
1	4	2	3	1	1	0	8	0	0.405
1	4	2	3	2	1	0	9	0	0.415
1	4	2	3	3	1	0	7	0	0.162
1	4	2	3	4	1	0	4	0	0.215
1	4	2	3	5	1	0	4	0	0.108
1	4	2	3	6	1	0	10	0	0.220
1	4	2	3	7	1	0	3	0	0.148
1	4	2	3	8	1	0	8	0	0.520
1	4	2	3	9	1	0	2	0	0.029
1	4	2	3	10	1	0	7	0	0.218
1	4	2	3	11	1	0	6	0	0.291
1	4	2	3	12	1	0	3	0	0.141
1	4	2	3	13	1	0	1	0	0.020
1	4	2	3	14	1	0	9	0	0.500
1	4	2	3	15	1	0	8	0	0.308
1	4	2	3	16	1	0	14	0	0.447
1	4	2	3	17	1	0	15	0	0.702
1	4	2	3	18	1	0	3	0	0.077
1	4	2	3	19	1	0	4	0	0.146
1	4	2	3	20	1	0	13	0	0.346
1	5	1	1	1	1	0	5	0	0.090
1	5	1	1	2	1	0	2	0	0.055
1	5	1	1	3	1	0	8	0	0.266
1	5	1	1	4	1	0	14	0	0.210
1	5	1	1	5	1	0	4	0	0.172
1	5	1	1	6	1	0	3	0	0.045
1	5	1	1	7	1	0	3	0	0.152
1	5	1	1	8	1	0	3	0	0.041
1	5	1	1	9	1	0	5	0	0.072
1	5	1	1	10	1	0	7	0	0.092
1	5	1	1	11	1	0	1	0	0.025
1	5	1	1	12	1	0	8	0	0.243
1	5	1	1	13	1	0	9	0	0.301
1	5	1	1	14	1	0	4	0	0.095
1	5	1	1	15	1	0	2	0	0.036
1	5	1	1	16	1	0	4	0	0.108
1	5	1	1	17	1	0	5	0	0.145
1	5	1	1	18	1	0	1	0	0.007
1	5	1	1	19	1	0	10	0	0.164
1	5	1	1	20	1	0	8	0	0.159
1	5	1	2	1	1	0	1	0	0.022
1	5	1	2	2	1	0	10	0	0.368
1	5	1	2	3	1	0	10	0	0.161
1	5	1	2	4	1	0	10	0	0.310
1	5	1	2	5	1	0	5	0	0.176
1	5	1	2	6	1	0	6	0	0.147
1	5	1	2	7	1	0	17	0	0.338
1	5	1	2	8	1	0	21	0	0.435
1	5	1	2	9	1	0	10	0	0.216
1	5	1	2	10	1	0	15	0	0.373
1	5	1	2	11	1	0	5	0	0.145
1	5	1	2	12	1	0	20	0	0.706
1	5	1	2	13	1	0	16	0	0.238
1	5	1	2	14	1	0	3	0	0.088
1	5	1	2	15	1	0	6	0	0.151
1	5	1	2	16	1	0	10	0	0.160
1	5	1	2	17	1	0	8	0	0.249
1	5	1	2	18	1	0	4	0	0.150
1	5	1	2	19	1	0	8	0	0.231
1	5	1	2	20	1	0	11	0	0.234
1	5	1	3	1	1	0	5	0	0.126
1	5	1	3	2	1	0	3	0	0.058
1	5	1	3	3	1	0	10	0	0.201
1	5	1	3	4	1	0	8	0	0.169
1	5	1	3	5	1	0	8	0	0.126

A	B	C	D	E	F	G	H	I	J
1	5	1	3	6	1	0	1	0	0.024
1	5	1	3	7	1	0	1	0	0.007
1	5	1	3	8	1	0	9	0	0.174
1	5	1	3	9	1	0	10	0	0.106
1	5	1	3	10	1	0	11	0	0.102
1	5	1	3	11	1	0	7	0	0.158
1	5	1	3	12	1	0	12	0	0.243
1	5	1	3	13	1	0	3	0	0.029
1	5	1	3	14	1	0	8	0	0.252
1	5	1	3	15	1	0	10	0	0.259
1	5	1	3	16	1	0	9	0	0.215
1	5	1	3	17	1	0	4	0	0.089
1	5	1	3	18	1	0	13	0	0.205
1	5	1	3	19	1	0	13	0	0.240
1	5	1	3	20	1	0	15	0	0.444
1	5	2	1	1	1	0	8	0	0.481
1	5	2	1	2	1	0	10	0	0.243
1	5	2	1	3	1	0	15	0	0.517
1	5	2	1	4	1	0	3	0	0.101
1	5	2	1	5	1	0	2	0	0.029
1	5	2	1	6	1	0	1	0	0.055
1	5	2	1	7	1	0	9	0	0.224
1	5	2	1	8	1	0	11	0	0.383
1	5	2	1	9	1	0	10	0	0.298
1	5	2	1	10	1	0	5	0	0.362
1	5	2	1	11	1	0	10	0	0.316
1	5	2	1	12	1	0	3	0	0.067
1	5	2	1	13	1	0	1	0	0.046
1	5	2	1	14	1	0	6	0	0.154
1	5	2	1	15	1	0	3	0	0.055
1	5	2	1	16	1	0	7	0	0.237
1	5	2	1	17	1	0	6	0	0.340
1	5	2	1	18	1	0	6	0	0.224
1	5	2	1	19	1	0	8	0	0.432
1	5	2	1	20	1	0	5	0	0.149
1	5	2	2	1	1	0	10	0	0.519
1	5	2	2	2	1	0	5	0	0.249
1	5	2	2	3	1	0	3	0	0.067
1	5	2	2	4	1	0	9	0	0.151
1	5	2	2	5	1	0	6	0	0.124
1	5	2	2	6	1	0	11	0	0.317
1	5	2	2	7	1	0	8	0	0.215
1	5	2	2	8	1	0	6	0	0.255
1	5	2	2	9	1	0	9	0	0.315
1	5	2	2	10	1	0	3	0	0.062
1	5	2	2	11	1	0	18	0	0.521
1	5	2	2	12	1	0	4	0	0.136
1	5	2	2	13	1	0	9	0	0.267
1	5	2	2	14	1	0	4	0	0.044
1	5	2	2	15	1	0	11	0	0.292
1	5	2	2	16	1	0	5	0	0.232
1	5	2	2	17	1	0	11	0	0.460
1	5	2	2	18	1	0	10	0	0.357
1	5	2	2	19	1	0	4	0	0.093
1	5	2	2	20	1	0	9	0	0.315
1	5	2	3	1	1	0	1	0	0.077
1	5	2	3	2	1	0	13	0	0.325
1	5	2	3	3	1	0	4	0	0.142
1	5	2	3	4	1	0	3	0	0.074
1	5	2	3	5	1	0	2	0	0.048
1	5	2	3	6	1	0	9	0	0.266
1	5	2	3	7	1	0	6	0	0.143
1	5	2	3	8	1	0	2	0	0.212
1	5	2	3	9	1	0	8	0	0.150
1	5	2	3	10	1	0	3	0	0.101
1	5	2	3	11	1	0	11	0	0.232

A	B	C	D	E	F	G	H	I	J
1	5	2	3	12	1	0	4	0	0.103
1	5	2	3	13	1	0	3	0	0.073
1	5	2	3	14	1	0	7	0	0.264
1	5	2	3	15	1	0	3	0	0.129
1	5	2	3	16	1	0	12	0	0.334
1	5	2	3	17	1	0	7	0	0.291
1	5	2	3	18	1	0	5	0	0.262
1	5	2	3	19	1	0	10	0	0.364
1	5	2	3	20	1	0	7	0	0.183
2	1	1	1	1	1	0	8	1	0.468
2	1	1	1	2	1	0	8	1	0.451
2	1	1	1	3	1	0	3	0	0.063
2	1	1	1	4	1	0	10	1	0.400
2	1	1	1	5	1	0	3	0	0.022
2	1	1	1	6	1	0	8	0	0.229
2	1	1	1	7	1	0	9	0	0.237
2	1	1	1	8	1	0	11	0	0.213
2	1	1	1	9	1	0	4	0	0.074
2	1	1	1	10	1	0	4	0	0.045
2	1	1	1	11	1	0	5	0	0.087
2	1	1	1	12	1	0	4	0	0.024
2	1	1	1	13	1	0	3	0	0.043
2	1	1	1	14	1	0	3	0	0.057
2	1	1	1	15	1	0	3	0	0.081
2	1	1	1	16	1	0	3	0	0.092
2	1	1	1	17	1	0	4	0	0.083
2	1	1	1	18	1	0	4	0	0.079
2	1	1	1	19	1	0	7	0	0.149
2	1	1	1	20	1	0	15	0	0.848
2	1	1	2	1	1	0	36	0	1.397
2	1	1	2	2	1	0	23	0	0.973
2	1	1	2	3	1	0	11	0	0.295
2	1	1	2	4	1	0	14	0	0.303
2	1	1	2	5	1	0	3	0	0.063
2	1	1	2	6	1	0	12	0	0.455
2	1	1	2	7	1	0	15	0	0.320
2	1	1	2	8	1	0	9	1	0.298
2	1	1	2	9	1	0	3	0	0.067
2	1	1	2	10	1	0	1	0	0.010
2	1	1	2	11	1	0	12	0	0.198
2	1	1	2	12	1	0	10	0	0.174
2	1	1	2	13	1	0	2	0	0.015
2	1	1	2	14	1	0	5	0	0.129
2	1	1	2	15	1	0	10	0	0.443
2	1	1	2	16	1	0	10	0	0.153
2	1	1	2	17	1	0	10	0	0.310
2	1	1	2	18	1	0	10	0	0.269
2	1	1	2	19	1	0	2	0	0.032
2	1	1	2	20	1	0	10	0	0.170
2	1	1	3	1	1	0	2	0	0.019
2	1	1	3	2	1	0	5	0	0.142
2	1	1	3	3	1	0	3	0	0.041
2	1	1	3	4	1	0	4	0	0.045
2	1	1	3	5	1	0	4	0	0.071
2	1	1	3	6	1	0	2	0	0.028
2	1	1	3	7	1	0	14	0	0.148
2	1	1	3	8	1	0	15	0	0.300
2	1	1	3	9	1	0	6	0	0.092
2	1	1	3	10	1	0	3	0	0.031
2	1	1	3	11	1	0	24	0	0.504
2	1	1	3	12	1	0	4	0	0.079
2	1	1	3	13	1	0	4	0	0.107
2	1	1	3	14	1	0	22	0	0.481
2	1	1	3	15	1	0	5	0	0.075
2	1	1	3	16	1	0	15	0	0.273
2	1	1	3	17	1	0	3	0	0.046

A	B	C	D	E	F	G	H	I	J
2	1	1	3	18	1	0	11	0	0.341
2	1	1	3	19	1	0	9	0	0.208
2	1	1	3	20	1	0	4	0	0.081
2	1	2	1	1	1	0	8	0	0.218
2	1	2	1	2	1	0	7	0	0.155
2	1	2	1	3	1	0	7	0	0.162
2	1	2	1	4	1	0	9	0	0.242
2	1	2	1	5	1	0	4	0	0.080
2	1	2	1	6	1	0	5	0	0.086
2	1	2	1	7	1	0	5	0	0.112
2	1	2	1	8	1	0	4	0	0.083
2	1	2	1	9	1	0	3	0	0.051
2	1	2	1	10	1	0	6	0	0.136
2	1	2	1	11	1	0	8	0	0.184
2	1	2	1	12	1	0	2	0	0.039
2	1	2	1	13	1	0	8	0	0.266
2	1	2	1	14	1	0	4	0	0.036
2	1	2	1	15	1	0	7	0	0.198
2	1	2	1	16	1	0	6	0	0.188
2	1	2	1	17	1	0	6	0	0.142
2	1	2	1	18	1	0	4	0	0.032
2	1	2	1	19	1	0	3	0	0.046
2	1	2	1	20	1	0	4	0	0.058
2	1	2	2	1	1	0	17	1	0.926
2	1	2	2	2	1	0	8	1	0.479
2	1	2	2	3	1	0	14	1	0.997
2	1	2	2	4	1	0	19	3	1.484
2	1	2	2	5	1	0	19	0	0.867
2	1	2	2	6	1	0	4	0	0.143
2	1	2	2	7	1	0	12	0	0.300
2	1	2	2	8	1	0	10	0	0.462
2	1	2	2	9	1	0	7	0	0.215
2	1	2	2	10	1	0	5	0	0.197
2	1	2	2	11	1	0	20	1	1.000
2	1	2	2	12	1	0	12	1	0.536
2	1	2	2	13	1	0	10	0	0.388
2	1	2	2	14	1	0	12	0	0.353
2	1	2	2	15	1	0	9	0	0.386
2	1	2	2	16	1	0	13	0	0.304
2	1	2	2	17	1	0	1	0	0.025
2	1	2	2	18	1	0	10	0	0.438
2	1	2	2	19	1	0	4	0	0.122
2	1	2	2	20	1	0	10	0	0.252
2	1	2	3	1	1	0	10	0	0.200
2	1	2	3	2	1	0	11	0	0.314
2	1	2	3	3	1	0	5	0	0.118
2	1	2	3	4	1	0	8	0	0.157
2	1	2	3	5	1	0	2	0	0.046
2	1	2	3	6	1	0	6	0	0.132
2	1	2	3	7	1	0	6	0	0.139
2	1	2	3	8	1	0	6	0	0.068
2	1	2	3	9	1	0	3	0	0.023
2	1	2	3	10	1	0	2	0	0.017
2	1	2	3	11	1	0	5	0	0.071
2	1	2	3	12	1	0	3	0	0.018
2	1	2	3	13	1	0	3	0	0.066
2	1	2	3	14	1	0	2	0	0.029
2	1	2	3	15	1	0	5	0	0.077
2	1	2	3	16	1	0	3	0	0.030
2	1	2	3	17	1	0	10	0	0.262
2	1	2	3	18	1	0	12	0	0.206
2	1	2	3	19	1	0	16	0	0.321
2	1	2	3	20	1	0	4	0	0.083
2	2	1	1	1	1	0	12	0	0.447
2	2	1	1	2	1	0	15	0	0.501
2	2	1	1	3	1	0	3	0	0.048

A	B	C	D	E	F	G	H	I	J
2	2	1	1	4	1	0	11	0	0.224
2	2	1	1	5	1	0	6	0	0.078
2	2	1	1	6	1	0	12	0	0.279
2	2	1	1	7	1	0	11	0	0.388
2	2	1	1	8	1	0	9	1	0.229
2	2	1	1	9	1	0	11	0	0.181
2	2	1	1	10	1	0	8	0	0.202
2	2	1	1	11	1	0	5	0	0.047
2	2	1	1	12	1	0	23	0	0.573
2	2	1	1	13	1	0	6	0	0.115
2	2	1	1	14	1	0	5	0	0.135
2	2	1	1	15	1	0	4	0	0.038
2	2	1	1	16	1	0	9	0	0.171
2	2	1	1	17	1	0	9	0	0.261
2	2	1	1	18	1	0	4	0	0.068
2	2	1	1	19	1	0	3	0	0.052
2	2	1	1	20	1	0	11	0	0.242
2	2	1	2	1	1	0	14	4	1.133
2	2	1	2	2	1	0	11	1	0.436
2	2	1	2	3	1	0	15	0	0.484
2	2	1	2	4	1	0	8	0	0.157
2	2	1	2	5	1	0	10	0	0.256
2	2	1	2	6	1	0	20	0	0.397
2	2	1	2	7	1	0	13	0	0.662
2	2	1	2	8	1	0	1	0	0.037
2	2	1	2	9	1	0	6	0	0.109
2	2	1	2	10	1	0	8	0	0.109
2	2	1	2	11	1	0	6	0	0.132
2	2	1	2	12	1	0	8	0	1.146
2	2	1	2	13	1	0	8	0	0.216
2	2	1	2	14	1	0	22	0	0.238
2	2	1	2	15	1	0	10	0	0.304
2	2	1	2	16	1	0	6	0	0.140
2	2	1	2	17	1	0	19	1	0.995
2	2	1	2	18	1	0	5	0	0.099
2	2	1	2	19	1	0	5	0	0.113
2	2	1	2	20	1	0	1	0	0.017
2	2	1	3	1	1	0	10	0	0.238
2	2	1	3	2	1	0	13	0	0.305
2	2	1	3	3	1	0	11	0	0.188
2	2	1	3	4	1	0	6	0	0.145
2	2	1	3	5	1	0	9	0	0.196
2	2	1	3	6	1	0	4	0	0.080
2	2	1	3	7	1	0	4	0	0.058
2	2	1	3	8	1	0	4	0	0.049
2	2	1	3	9	1	0	5	0	0.097
2	2	1	3	10	1	0	5	0	0.093
2	2	1	3	11	1	0	8	0	0.188
2	2	1	3	12	1	0	8	0	0.091
2	2	1	3	13	1	0	3	0	0.051
2	2	1	3	14	1	0	8	0	0.195
2	2	1	3	15	1	0	5	0	0.053
2	2	1	3	16	1	0	5	0	0.068
2	2	1	3	17	1	0	6	0	0.127
2	2	1	3	18	1	0	10	0	0.350
2	2	1	3	19	1	0	4	0	0.089
2	2	1	3	20	1	0	7	0	0.101
2	2	2	1	1	1	0	10	0	0.231
2	2	2	1	2	1	0	9	0	0.204
2	2	2	1	3	1	0	10	0	0.364
2	2	2	1	4	1	0	6	0	0.158
2	2	2	1	5	1	0	9	0	0.375
2	2	2	1	6	1	0	4	0	0.061
2	2	2	1	7	1	0	2	0	0.048
2	2	2	1	8	1	0	3	0	0.068
2	2	2	1	9	1	0	6	0	0.121

A	B	C	D	E	F	G	H	I	J
2	2	2	1	10	1	0	10	0	0.434
2	2	2	1	11	1	0	7	0	0.572
2	2	2	1	12	1	0	13	0	0.302
2	2	2	1	13	1	0	10	0	0.282
2	2	2	1	14	1	0	10	0	0.450
2	2	2	1	15	1	0	10	0	0.247
2	2	2	1	16	1	0	9	0	0.726
2	2	2	1	17	1	0	18	0	0.247
2	2	2	1	18	1	0	8	0	0.131
2	2	2	1	19	1	0	3	1	0.129
2	2	2	1	20	1	0	10	1	0.742
2	2	2	2	1	1	0	7	0	0.126
2	2	2	2	2	1	0	10	0	0.288
2	2	2	2	3	1	0	11	0	0.331
2	2	2	2	4	1	0	11	0	0.277
2	2	2	2	5	1	0	9	0	0.264
2	2	2	2	6	1	0	3	0	0.095
2	2	2	2	7	1	0	5	0	0.083
2	2	2	2	8	1	0	10	0	0.222
2	2	2	2	9	1	0	7	0	0.226
2	2	2	2	10	1	0	9	1	0.373
2	2	2	2	11	1	0	8	0	0.274
2	2	2	2	12	1	0	4	0	0.150
2	2	2	2	13	1	0	7	0	0.108
2	2	2	2	14	1	0	9	0	0.166
2	2	2	2	15	1	0	12	1	0.525
2	2	2	2	16	1	0	8	0	0.356
2	2	2	2	17	1	0	10	0	0.213
2	2	2	2	18	1	0	11	0	0.310
2	2	2	2	19	1	0	17	0	0.404
2	2	2	2	20	1	0	12	0	0.342
2	2	2	3	1	1	0	19	4	0.877
2	2	2	3	2	1	0	22	1	1.081
2	2	2	3	3	1	0	6	1	0.147
2	2	2	3	4	1	0	7	0	0.275
2	2	2	3	5	1	0	6	0	0.184
2	2	2	3	6	1	0	11	1	0.568
2	2	2	3	7	1	0	6	0	0.082
2	2	2	3	8	1	0	11	1	0.615
2	2	2	3	9	1	0	6	0	0.169
2	2	2	3	10	1	0	9	0	0.403
2	2	2	3	11	1	0	7	0	0.121
2	2	2	3	12	1	0	4	0	0.117
2	2	2	3	13	1	0	8	0	0.300
2	2	2	3	14	1	0	9	0	0.340
2	2	2	3	15	1	0	9	0	0.180
2	2	2	3	16	1	0	13	1	0.599
2	2	2	3	17	1	0	4	0	0.082
2	2	2	3	18	1	0	15	0	0.345
2	2	2	3	19	1	0	5	0	0.147
2	2	2	3	20	1	0	17	0	0.690
2	3	1	1	1	2	8	6	0	0.099
2	3	1	1	1	2	8	10	0	0.233
2	3	1	1	2	2	8	9	0	0.171
2	3	1	1	2	2	8	1	0	0.010
2	3	1	1	3	2	8	6	0	0.092
2	3	1	1	3	2	8	13	0	0.411
2	3	1	1	4	2	8	2	0	0.019
2	3	1	1	4	2	8	8	0	0.199
2	3	1	1	5	2	8	1	0	0.006
2	3	1	1	5	2	8	7	0	0.182
2	3	1	1	6	2	8	9	0	0.185
2	3	1	1	6	2	8	4	0	0.080
2	3	1	1	7	2	8	8	0	0.143
2	3	1	1	7	2	8	17	1	0.796
2	3	1	1	8	2	8	2	0	0.034

A	B	C	D	E	F	G	H	I	J
2	3	1	1	8	2	8	10	0	0.164
2	3	1	1	9	2	8	6	0	0.104
2	3	1	1	9	2	8	12	0	0.341
2	3	1	1	10	2	8	2	0	0.013
2	3	1	1	10	2	8	13	0	0.384
2	3	1	1	11	2	8	9	0	0.179
2	3	1	1	12	2	8	2	0	0.025
2	3	1	1	13	2	8	2	0	0.044
2	3	1	1	14	2	8	5	0	0.074
2	3	1	1	15	2	8	1	0	0.010
2	3	1	1	16	2	8	1	0	0.016
2	3	1	1	17	2	8	1	0	0.028
2	3	1	1	18	2	8	1	0	0.015
2	3	1	1	19	2	8	10	0	0.189
2	3	1	1	20	2	8	12	0	0.335
2	3	1	2	1	3	21	1	0	0.005
2	3	1	2	1	2	8	19	0	0.517
2	3	1	2	2	3	21	3	0	0.031
2	3	1	2	2	2	8	3	0	0.047
2	3	1	2	3	3	21	4	0	0.063
2	3	1	2	3	2	8	1	0	0.009
2	3	1	2	4	3	21	7	0	0.139
2	3	1	2	4	2	8	1	0	0.022
2	3	1	2	5	3	21	6	0	0.050
2	3	1	2	5	2	8	1	0	0.006
2	3	1	2	6	3	21	1	0	0.007
2	3	1	2	6	2	8	4	0	0.055
2	3	1	2	7	3	21	3	0	0.030
2	3	1	2	7	2	8	7	0	0.133
2	3	1	2	8	3	21	3	0	0.034
2	3	1	2	8	2	8	5	0	0.066
2	3	1	2	9	3	21	1	0	0.013
2	3	1	2	9	2	8	1	0	0.006
2	3	1	2	10	3	21	1	0	0.011
2	3	1	2	10	2	8	3	0	0.057
2	3	1	2	11	3	21	9	0	0.177
2	3	1	2	11	2	8	4	0	0.055
2	3	1	2	12	3	21	8	0	0.120
2	3	1	2	13	3	21	2	0	0.016
2	3	1	2	14	3	21	5	0	0.069
2	3	1	2	15	3	21	6	0	0.119
2	3	1	2	16	3	21	11	0	0.342
2	3	1	2	17	3	21	1	0	0.009
2	3	1	2	18	3	21	1	0	0.015
2	3	1	2	19	3	21	2	0	0.045
2	3	1	2	20	3	21	1	0	0.012
2	3	1	3	1	1	0	3	0	0.038
2	3	1	3	2	1	0	3	0	0.054
2	3	1	3	3	1	0	5	0	0.089
2	3	1	3	4	1	0	3	0	0.068
2	3	1	3	5	1	0	6	0	0.071
2	3	1	3	6	1	0	6	0	0.167
2	3	1	3	7	1	0	6	1	0.281
2	3	1	3	8	1	0	19	1	0.827
2	3	1	3	9	1	0	24	0	0.688
2	3	1	3	10	1	0	14	0	0.491
2	3	1	3	11	1	0	13	0	0.229
2	3	1	3	12	1	0	9	0	0.298
2	3	1	3	13	1	0	10	0	0.242
2	3	1	3	14	1	0	6	0	0.079
2	3	1	3	15	1	0	10	0	0.209
2	3	1	3	16	1	0	26	1	0.918
2	3	1	3	17	1	0	21	0	0.575
2	3	1	3	18	1	0	12	0	0.219
2	3	1	3	19	1	0	15	0	0.291
2	3	1	3	20	1	0	1	0	0.014

A	B	C	D	E	F	G	H	I	J
2	3	2	1	1	1	0	22	0	0.724
2	3	2	1	2	1	0	5	0	0.066
2	3	2	1	3	1	0	26	1	1.358
2	3	2	1	4	1	0	4	0	0.049
2	3	2	1	5	1	0	12	0	0.444
2	3	2	1	6	1	0	6	0	0.098
2	3	2	1	7	1	0	8	0	0.199
2	3	2	1	8	1	0	4	0	0.077
2	3	2	1	9	1	0	16	0	1.057
2	3	2	1	10	1	0	17	1	0.732
2	3	2	1	11	1	0	8	0	0.284
2	3	2	1	12	1	0	7	0	0.154
2	3	2	1	13	1	0	5	0	0.201
2	3	2	1	14	1	0	2	0	0.019
2	3	2	1	15	1	0	8	0	0.224
2	3	2	1	16	1	0	11	0	0.438
2	3	2	1	17	1	0	1	0	0.023
2	3	2	1	18	1	0	24	0	0.565
2	3	2	1	19	1	0	16	0	0.603
2	3	2	1	20	1	0	14	0	0.278
2	3	2	2	1	1	0	12	1	0.985
2	3	2	2	2	1	0	13	0	0.468
2	3	2	2	3	1	0	9	0	0.345
2	3	2	2	4	1	0	13	0	0.398
2	3	2	2	5	1	0	12	0	0.416
2	3	2	2	6	1	0	1	0	0.033
2	3	2	2	7	1	0	16	0	0.559
2	3	2	2	8	1	0	11	0	0.463
2	3	2	2	9	1	0	11	1	0.834
2	3	2	2	10	1	0	9	0	0.215
2	3	2	2	11	1	0	13	0	0.464
2	3	2	2	12	1	0	9	0	0.303
2	3	2	2	13	1	0	11	0	0.296
2	3	2	2	14	1	0	7	0	0.263
2	3	2	2	15	1	0	10	0	0.366
2	3	2	2	16	1	0	10	0	0.385
2	3	2	2	17	1	0	11	0	0.269
2	3	2	2	18	1	0	4	0	0.095
2	3	2	2	19	1	0	5	0	0.256
2	3	2	2	20	1	0	7	0	0.167
2	3	2	3	1	1	0	16	0	0.358
2	3	2	3	2	1	0	12	0	0.441
2	3	2	3	3	1	0	4	0	0.084
2	3	2	3	4	1	0	4	0	0.139
2	3	2	3	5	1	0	9	0	0.241
2	3	2	3	6	1	0	14	0	0.353
2	3	2	3	7	1	0	11	0	0.226
2	3	2	3	8	1	0	8	0	0.125
2	3	2	3	9	1	0	3	0	0.121
2	3	2	3	10	1	0	10	0	0.220
2	3	2	3	11	1	0	11	0	0.341
2	3	2	3	12	1	0	12	0	0.302
2	3	2	3	13	1	0	2	0	0.031
2	3	2	3	14	1	0	9	0	0.215
2	3	2	3	15	1	0	13	0	0.248
2	3	2	3	16	1	0	12	0	0.434
2	3	2	3	17	1	0	9	0	0.179
2	3	2	3	18	1	0	12	0	0.230
2	3	2	3	19	1	0	4	0	0.051
2	3	2	3	20	1	0	10	0	0.290
2	4	1	1	1	1	0	17	0	0.481
2	4	1	1	2	1	0	11	0	0.470
2	4	1	1	3	1	0	12	0	0.848
2	4	1	1	4	1	0	8	0	0.387
2	4	1	1	5	1	0	10	0	0.182
2	4	1	1	6	1	0	21	0	0.943
2	4	1	1	7	1	0	9	0	0.232
2	4	1	1	8	1	0	10	0	0.284
2	4	1	1	9	1	0	13	0	0.385
2	4	1	1	10	1	0	5	0	0.207
2	4	1	1	11	1	0	6	0	0.165
2	4	1	1	12	1	0	9	0	0.236
2	4	1	1	13	1	0	7	0	0.207
2	4	1	1	14	1	0	9	0	0.191
2	4	1	1	15	1	0	7	0	0.164
2	4	1	1	16	1	0	16	0	0.597
2	4	1	1	17	1	0	11	0	0.521
2	4	1	1	18	1	0	7	0	0.227
2	4	1	1	19	1	0	10	0	0.419
2	4	1	1	20	1	0	4	0	0.095
2	4	1	3	1	1	0	21	3	1.301
2	4	1	3	2	1	0	10	0	0.417
2	4	1	3	3	1	0	6	0	0.271
2	4	1	3	4	1	0	7	0	0.288
2	4	1	3	5	1	0	10	0	0.365
2	4	1	3	6	1	0	6	0	0.141
2	4	1	3	7	1	0	5	0	0.167
2	4	1	3	8	1	0	3	0	0.155
2	4	1	3	9	1	0	11	1	0.779
2	4	1	3	10	1	0	11	0	0.404
2	4	1	3	11	1	0	9	0	0.307
2	4	1	3	12	1	0	6	0	0.273
2	4	1	3	13	1	0	10	0	0.368
2	4	1	3	14	1	0	9	0	0.300
2	4	1	3	15	1	0	4	0	0.109
2	4	1	3	16	1	0	7	0	0.179
2	4	1	3	17	1	0	4	0	0.121
2	4	1	3	18	1	0	10	0	0.374
2	4	1	3	19	1	0	26	0	0.866
2	4	1	3	20	1	0	10	0	0.237
2	4	2	1	1	1	0	32	0	0.982
2	4	2	1	2	1	0	24	1	1.299
2	4	2	1	3	1	0	29	3	1.824
2	4	2	1	4	1	0	8	1	0.509
2	4	2	1	5	1	0	11	0	0.318
2	4	2	1	6	1	0	11	0	0.349
2	4	2	1	7	1	0	11	1	0.509
2	4	2	1	8	1	0	11	1	0.552
2	4	2	1	9	1	0	18	0	0.641
2	4	2	1	10	1	0	11	0	0.394
2	4	2	1	11	1	0	17	0	0.749
2	4	2	1	12	1	0	7	0	0.238
2	4	2	1	13	1	0	17	0	0.665
2	4	2	1	14	1	0	3	0	0.061
2	4	2	1	15	1	0	11	0	0.302
2	4	2	1	16	1	0	14	0	0.590
2	4	2	1	17	1	0	12	0	0.470
2	4	2	1	18	1	0	15	0	0.605
2	4	2	1	19	1	0	29	0	0.920
2	4	2	1	20	1	0	38	0	1.595
2	4	2	2	1	1	0	32	0	1.155
2	4	2	2	2	1	0	10	0	0.274
2	4	2	2	3	1	0	19	0	0.640
2	4	2	2	4	1	0	20	0	0.662
2	4	2	2	5	1	0	15	0	0.450
2	4	2	2	6	1	0	21	0	1.064
2	4	2	2	7	1	0	13	0	0.683
2	4	2	2	8	1	0	3	0	0.059
2	4	2	2	9	1	0	11	0	0.397
2	4	2	2	10	1	0	14	0	0.755
2	4	2	2	11	1	0	11	0	0.544
2	4	2	2	12	1	0	6	0	0.202

A	B	C	D	E	F	G	H	I	J
2	4	2	2	13	1	0	15	0	0.681
2	4	2	2	14	1	0	19	1	0.892
2	4	2	2	15	1	0	6	0	0.157
2	4	2	2	16	1	0	6	0	0.156
2	4	2	2	17	1	0	10	0	0.674
2	4	2	2	18	1	0	6	0	0.230
2	4	2	2	19	1	0	4	0	0.122
2	4	2	2	20	1	0	19	0	0.827
2	4	2	3	1	1	0	28	1	1.270
2	4	2	3	2	1	0	22	0	1.240
2	4	2	3	3	1	0	19	1	0.711
2	4	2	3	4	1	0	14	1	0.513
2	4	2	3	5	1	0	12	1	0.453
2	4	2	3	6	1	0	15	0	0.460
2	4	2	3	7	1	0	12	0	0.606
2	4	2	3	8	1	0	12	0	0.426
2	4	2	3	9	1	0	12	1	0.627
2	4	2	3	10	1	0	15	1	0.651
2	4	2	3	11	1	0	6	0	0.282
2	4	2	3	12	1	0	12	0	0.409
2	4	2	3	13	1	0	16	1	0.710
2	4	2	3	14	1	0	10	0	0.343
2	4	2	3	15	1	0	14	0	0.256
2	4	2	3	16	1	0	4	0	0.082
2	4	2	3	17	1	0	12	1	0.384
2	4	2	3	18	1	0	14	1	0.559
2	4	2	3	19	1	0	13	1	0.574
2	4	2	3	20	1	0	8	0	0.244
2	5	1	1	1	1	0	25	0	1.119
2	5	1	1	2	1	0	30	0	1.083
2	5	1	1	3	1	0	14	0	0.559
2	5	1	1	4	1	0	15	0	0.259
2	5	1	1	5	1	0	19	0	0.489
2	5	1	1	6	1	0	8	0	0.274
2	5	1	1	7	1	0	11	0	0.352
2	5	1	1	8	1	0	3	0	0.042
2	5	1	1	9	1	0	13	0	0.376
2	5	1	1	10	1	0	6	0	0.117
2	5	1	1	11	1	0	6	0	0.132
2	5	1	1	12	1	0	19	0	0.657
2	5	1	1	13	1	0	6	0	0.137
2	5	1	1	14	1	0	12	0	0.319
2	5	1	1	15	1	0	14	0	0.311
2	5	1	1	16	1	0	4	0	0.060
2	5	1	1	17	1	0	6	0	0.121
2	5	1	1	18	1	0	9	0	0.235
2	5	1	1	19	1	0	5	0	0.159
2	5	1	1	20	1	0	21	0	0.992
2	5	1	2	1	1	0	13	0	0.655
2	5	1	2	2	1	0	20	0	0.504
2	5	1	2	3	1	0	13	0	0.401
2	5	1	2	4	1	0	9	0	0.140
2	5	1	2	5	1	0	3	0	0.119
2	5	1	2	6	1	0	6	0	0.156
2	5	1	2	7	1	0	3	0	0.071
2	5	1	2	8	1	0	7	0	0.152
2	5	1	2	9	1	0	5	0	0.129
2	5	1	2	10	1	0	10	0	0.400
2	5	1	2	11	1	0	7	0	0.203
2	5	1	2	12	1	0	10	0	0.141
2	5	1	2	13	1	0	12	0	0.163
2	5	1	2	14	1	0	15	0	0.320
2	5	1	2	15	1	0	13	0	0.328
2	5	1	2	16	1	0	7	0	0.132
2	5	1	2	17	1	0	6	0	0.140
2	5	1	2	18	1	0	10	0	0.279
2	5	1	2	19	1	0	14	0	0.426
2	5	1	2	20	1	0	3	0	0.126
2	5	1	3	1	1	0	10	0	0.264
2	5	1	3	2	1	0	5	0	0.058
2	5	1	3	3	1	0	6	0	0.170
2	5	1	3	4	1	0	7	0	0.138
2	5	1	3	5	1	0	2	0	0.057
2	5	1	3	6	1	0	10	0	0.213
2	5	1	3	7	1	0	3	0	0.086
2	5	1	3	8	1	0	5	0	0.077
2	5	1	3	9	1	0	5	0	0.183
2	5	1	3	10	1	0	31	0	1.110
2	5	1	3	11	1	0	8	0	0.166
2	5	1	3	12	1	0	6	0	0.092
2	5	1	3	13	1	0	18	0	0.416
2	5	1	3	14	1	0	14	0	0.239
2	5	1	3	15	1	0	6	0	0.144
2	5	1	3	16	1	0	9	0	0.244
2	5	1	3	17	1	0	19	0	0.431
2	5	1	3	18	1	0	3	0	0.074
2	5	1	3	19	1	0	6	0	0.061
2	5	1	3	20	1	0	14	0	0.422
2	5	2	1	1	1	0	19	1	0.951
2	5	2	1	2	1	0	17	1	1.183
2	5	2	1	3	1	0	14	0	0.470
2	5	2	1	4	1	0	12	0	0.364
2	5	2	1	5	1	0	9	0	0.422
2	5	2	1	6	1	0	11	0	0.321
2	5	2	1	7	1	0	12	0	0.377
2	5	2	1	8	1	0	12	0	0.282
2	5	2	1	9	1	0	10	0	0.362
2	5	2	1	10	1	0	6	0	0.213
2	5	2	1	11	1	0	10	0	0.318
2	5	2	1	12	1	0	12	0	0.410
2	5	2	1	13	1	0	5	0	0.189
2	5	2	1	14	1	0	14	1	1.002
2	5	2	1	15	1	0	13	0	0.554
2	5	2	1	16	1	0	23	1	1.068
2	5	2	1	17	1	0	11	1	0.510
2	5	2	1	18	1	0	11	1	0.494
2	5	2	1	19	1	0	7	0	0.237
2	5	2	1	20	1	0	20	3	1.119
2	5	2	2	1	1	0	23	4	1.982
2	5	2	2	2	1	0	12	0	0.284
2	5	2	2	3	1	0	13	0	0.444
2	5	2	2	4	1	0	15	1	0.840
2	5	2	2	5	1	0	15	1	0.718
2	5	2	2	6	1	0	11	1	0.575
2	5	2	2	7	1	0	11	0	0.285
2	5	2	2	8	1	0	5	0	0.106
2	5	2	2	9	1	0	9	0	0.295
2	5	2	2	10	1	0	11	1	0.403
2	5	2	2	11	1	0	11	1	0.557
2	5	2	2	12	1	0	8	0	0.310
2	5	2	2	13	1	0	10	0	0.462
2	5	2	2	14	1	0	10	2	0.719
2	5	2	2	15	1	0	11	0	0.342
2	5	2	2	16	1	0	4	0	0.124
2	5	2	2	17	1	0	15	0	0.355
2	5	2	2	18	1	0	3	0	0.100
2	5	2	2	19	1	0	15	1	0.615
2	5	2	2	20	1	0	8	0	0.162
2	5	2	3	1	1	0	22	1	1.082
2	5	2	3	2	1	0	29	0	0.977
2	5	2	3	3	1	0	12	0	0.447
2	5	2	3	4	1	0	14	1	0.746

A	B	C	D	E	F	G	H	I	J
2	5	2	3	5	1	0	7	0	0.259
2	5	2	3	6	1	0	8	0	0.359
2	5	2	3	7	1	0	2	0	0.059
2	5	2	3	8	1	0	15	1	0.926
2	5	2	3	9	1	0	8	0	0.367
2	5	2	3	10	1	0	15	0	0.290
2	5	2	3	11	1	0	11	0	0.251
2	5	2	3	12	1	0	4	0	0.123
2	5	2	3	13	1	0	4	0	0.144
2	5	2	3	14	1	0	11	0	0.241
2	5	2	3	15	1	0	7	0	0.238
2	5	2	3	16	1	0	8	0	0.248
2	5	2	3	17	1	0	6	0	0.122
2	5	2	3	18	1	0	10	0	0.309
2	5	2	3	19	1	0	14	0	0.396
2	5	2	3	20	1	0	16	0	0.549
3	1	1	1	1	1	0	4	0	0.728
3	1	1	1	2	1	0	3	0	0.275
3	1	1	1	3	1	0	3	0	0.845
3	1	1	1	4	1	0	1	0	0.051
3	1	1	1	5	1	0	1	0	0.098
3	1	1	1	6	1	0	1	0	0.405
3	1	1	1	7	1	0	3	0	0.175
3	1	1	1	8	1	0	1	0	0.117
3	1	1	1	9	1	0	1	0	0.056
3	1	1	1	10	1	0	2	0	0.129
3	1	1	1	11	1	0	1	0	0.062
3	1	1	1	12	1	0	1	0	0.116
3	1	1	1	13	1	0	4	0	0.357
3	1	1	1	14	1	0	2	0	0.252
3	1	1	1	15	1	0	2	0	0.483
3	1	1	1	16	1	0	1	0	0.059
3	1	1	1	17	1	0	3	0	0.318
3	1	1	1	18	1	0	2	0	0.243
3	1	1	1	19	1	0	1	0	0.351
3	1	1	1	20	1	0	3	0	0.243
3	1	1	2	1	1	0	4	0	0.316
3	1	1	2	2	1	0	1	0	0.121
3	1	1	2	3	1	0	1	0	0.031
3	1	1	2	4	1	0	3	0	0.078
3	1	1	2	5	1	0	1	0	0.031
3	1	1	2	6	1	0	1	0	0.239
3	1	1	2	7	1	0	3	0	0.487
3	1	1	2	8	1	0	2	0	0.059
3	1	1	2	9	1	0	2	0	0.308
3	1	1	2	10	1	0	3	0	0.271
3	1	1	2	11	1	0	1	0	0.040
3	1	1	2	12	1	0	2	0	0.068
3	1	1	2	13	1	0	2	0	0.309
3	1	1	2	14	1	0	3	0	0.128
3	1	1	2	15	1	0	1	0	0.087
3	1	1	2	16	1	0	2	0	0.121
3	1	1	2	17	1	0	2	0	0.060
3	1	1	2	18	1	0	5	0	0.469
3	1	1	2	19	1	0	2	0	0.122
3	1	1	2	20	1	0	4	0	0.284
3	1	1	3	1	1	0	1	0	0.093
3	1	1	3	2	1	0	1	0	0.121
3	1	1	3	3	1	0	1	0	0.058
3	1	1	3	4	1	0	1	0	0.018
3	1	1	3	5	1	0	3	0	0.233
3	1	1	3	6	1	0	3	0	0.230
3	1	1	3	7	1	0	3	0	0.188
3	1	1	3	8	1	0	3	0	0.233
3	1	1	3	9	1	0	2	0	0.071
3	1	1	3	10	1	0	2	0	0.115
3	1	1	3	11	1	0	7	0	0.498
3	1	1	3	12	1	0	1	0	0.045
3	1	1	3	13	1	0	2	0	0.204
3	1	1	3	14	1	0	4	0	0.141
3	1	1	3	15	1	0	1	0	0.049
3	1	1	3	16	1	0	1	0	0.056
3	1	1	3	17	1	0	1	0	0.081
3	1	1	3	18	1	0	6	0	0.503
3	1	1	3	19	1	0	2	0	0.184
3	1	1	3	20	1	0	1	0	0.085
3	1	2	1	1	1	0	5	0	0.291
3	1	2	1	2	1	0	5	0	0.321
3	1	2	1	3	1	0	1	0	0.744
3	1	2	1	4	1	0	1	0	0.061
3	1	2	1	5	1	0	6	0	0.276
3	1	2	1	6	1	0	3	0	0.540
3	1	2	1	7	1	0	4	0	0.156
3	1	2	1	8	1	0	4	0	0.191
3	1	2	1	9	1	0	3	0	0.619
3	1	2	1	10	1	0	4	0	0.718
3	1	2	1	11	1	0	6	0	0.169
3	1	2	1	12	1	0	2	0	0.805
3	1	2	1	13	1	0	4	0	0.253
3	1	2	1	14	1	0	2	1	0.727
3	1	2	1	15	1	0	8	0	0.505
3	1	2	1	16	1	0	2	0	0.560
3	1	2	1	17	1	0	4	0	0.553
3	1	2	1	18	1	0	4	0	0.674
3	1	2	1	19	1	0	1	0	0.367
3	1	2	1	20	1	0	1	0	0.521
3	1	2	2	1	1	0	2	0	0.216
3	1	2	2	2	1	0	4	0	0.413
3	1	2	2	3	1	0	3	0	0.785
3	1	2	2	4	1	0	4	0	1.081
3	1	2	2	5	1	0	2	0	1.085
3	1	2	2	6	1	0	2	0	0.431
3	1	2	2	7	1	0	1	0	0.654
3	1	2	2	8	1	0	1	0	0.801
3	1	2	2	9	1	0	1	0	0.131
3	1	2	2	10	1	0	1	0	0.211
3	1	2	2	11	1	0	1	0	0.758
3	1	2	2	12	1	0	1	0	0.653
3	1	2	2	13	1	0	1	0	0.572
3	1	2	2	14	1	0	3	0	0.771
3	1	2	2	15	1	0	1	0	0.361
3	1	2	2	16	1	0	3	0	0.296
3	1	2	2	17	1	0	2	0	0.655
3	1	2	2	18	1	0	2	0	0.444
3	1	2	2	19	1	0	3	0	1.177
3	1	2	2	20	1	0	2	0	0.662
3	1	2	3	1	1	0	2	0	0.158
3	1	2	3	2	1	0	3	0	0.115
3	1	2	3	3	1	0	2	0	0.363
3	1	2	3	4	1	0	2	0	0.482
3	1	2	3	5	1	0	2	0	0.416
3	1	2	3	6	1	0	1	0	0.838
3	1	2	3	7	1	0	1	0	0.384
3	1	2	3	8	1	0	1	0	0.606
3	1	2	3	9	1	0	4	0	0.407
3	1	2	3	10	1	0	3	0	0.161
3	1	2	3	11	1	0	3	0	0.817
3	1	2	3	12	1	0	4	0	0.771
3	1	2	3	13	1	0	5	0	0.426
3	1	2	3	14	1	0	5	0	0.810
3	1	2	3	15	1	0	1	0	0.207
3	1	2	3	16	1	0	1	0	0.317

A	B	C	D	E	F	G	H	I	J
3	1	2	3	17	1	0	3	0	0.491
3	1	2	3	18	1	0	3	0	0.327
3	1	2	3	19	1	0	1	0	0.479
3	1	2	3	20	1	0	1	0	0.558
3	2	1	1	1	1	0	1	1	0.490
3	2	1	1	2	1	0	3	0	0.730
3	2	1	1	3	1	0	1	0	0.142
3	2	1	1	4	1	0	2	0	0.366
3	2	1	1	5	1	0	1	0	0.155
3	2	1	1	6	1	0	2	0	0.166
3	2	1	1	7	1	0	2	0	0.158
3	2	1	1	8	1	0	1	0	0.071
3	2	1	1	9	1	0	1	0	0.055
3	2	1	1	10	1	0	1	0	0.176
3	2	1	1	11	1	0	3	0	0.289
3	2	1	1	12	1	0	1	0	0.150
3	2	1	1	13	1	0	1	0	0.119
3	2	1	1	14	1	0	2	0	0.184
3	2	1	1	15	1	0	2	0	0.176
3	2	1	1	16	1	0	3	0	0.196
3	2	1	1	17	1	0	1	0	0.125
3	2	1	1	18	1	0	4	0	0.373
3	2	1	1	19	1	0	1	0	0.077
3	2	1	1	20	1	0	0	.	0.000
3	2	1	2	1	1	0	8	0	1.110
3	2	1	2	2	1	0	3	0	0.424
3	2	1	2	3	1	0	3	0	0.227
3	2	1	2	4	1	0	1	0	0.076
3	2	1	2	5	1	0	2	0	0.184
3	2	1	2	6	1	0	2	0	0.290
3	2	1	2	7	1	0	3	0	0.162
3	2	1	2	8	1	0	1	0	0.107
3	2	1	2	9	1	0	2	0	0.090
3	2	1	2	10	1	0	2	0	0.267
3	2	1	2	11	1	0	2	0	0.076
3	2	1	2	12	1	0	1	0	0.145
3	2	1	2	13	1	0	1	0	0.066
3	2	1	2	14	1	0	2	0	0.163
3	2	1	2	15	1	0	1	0	0.077
3	2	1	2	16	1	0	2	0	0.061
3	2	1	2	17	1	0	1	0	0.089
3	2	1	2	18	1	0	1	0	0.065
3	2	1	2	19	1	0	2	0	0.240
3	2	1	2	20	1	0	1	0	0.167
3	2	1	3	1	1	0	4	1	1.144
3	2	1	3	2	1	0	3	0	0.443
3	2	1	3	3	1	0	4	0	0.627
3	2	1	3	4	1	0	1	0	0.115
3	2	1	3	5	1	0	1	0	0.070
3	2	1	3	6	1	0	1	0	0.067
3	2	1	3	7	1	0	2	0	0.081
3	2	1	3	8	1	0	2	0	0.098
3	2	1	3	9	1	0	1	0	0.118
3	2	1	3	10	1	0	1	0	0.119
3	2	1	3	11	1	0	1	0	0.166
3	2	1	3	12	1	0	1	0	0.043
3	2	1	3	13	1	0	1	0	0.070
3	2	1	3	14	1	0	1	0	0.165
3	2	1	3	15	1	0	1	0	0.168
3	2	1	3	16	1	0	1	0	0.147
3	2	1	3	17	1	0	3	0	0.294
3	2	1	3	18	1	0	2	0	0.203
3	2	1	3	19	1	0	1	0	0.313
3	2	1	3	20	1	0	1	0	0.187
3	2	2	1	1	1	0	1	0	0.727
3	2	2	1	2	1	0	3	0	0.487

A	B	C	D	E	F	G	H	I	J
3	2	2	1	3	1	0	2	0	0.311
3	2	2	1	4	1	0	3	0	0.426
3	2	2	1	5	1	0	1	0	0.241
3	2	2	1	6	1	0	3	0	0.291
3	2	2	1	7	1	0	1	0	0.348
3	2	2	1	8	1	0	2	0	0.255
3	2	2	1	9	1	0	1	0	0.341
3	2	2	1	10	1	0	1	0	0.115
3	2	2	1	11	1	0	1	0	0.148
3	2	2	1	12	1	0	1	0	0.167
3	2	2	1	13	1	0	3	0	0.563
3	2	2	1	14	1	0	1	0	0.106
3	2	2	1	15	1	0	3	0	0.351
3	2	2	1	16	1	0	3	0	0.459
3	2	2	1	17	1	0	2	0	0.483
3	2	2	1	18	1	0	3	0	0.510
3	2	2	1	19	1	0	1	0	0.408
3	2	2	1	20	1	0	4	0	1.021
3	2	2	2	1	1	0	1	0	0.229
3	2	2	2	2	1	0	2	0	0.355
3	2	2	2	3	1	0	4	0	0.604
3	2	2	2	4	1	0	1	0	0.072
3	2	2	2	5	1	0	5	0	0.858
3	2	2	2	6	1	0	1	0	0.291
3	2	2	2	7	1	0	4	0	0.551
3	2	2	2	8	1	0	5	0	0.477
3	2	2	2	9	1	0	3	0	0.523
3	2	2	2	10	1	0	3	0	0.867
3	2	2	2	11	1	0	2	0	0.163
3	2	2	2	12	1	0	2	0	0.946
3	2	2	2	13	1	0	4	0	0.708
3	2	2	2	14	1	0	2	0	0.227
3	2	2	2	15	1	0	3	0	0.966
3	2	2	2	16	1	0	4	0	0.314
3	2	2	2	17	1	0	2	0	0.231
3	2	2	2	18	1	0	3	0	0.633
3	2	2	2	19	1	0	6	0	0.874
3	2	2	2	20	1	0	1	0	0.277
3	2	2	3	1	1	0	3	0	0.596
3	2	2	3	2	1	0	4	0	0.912
3	2	2	3	3	1	0	4	0	0.511
3	2	2	3	4	1	0	4	0	0.611
3	2	2	3	5	1	0	2	0	0.313
3	2	2	3	6	1	0	1	0	0.282
3	2	2	3	7	1	0	1	0	0.149
3	2	2	3	8	1	0	5	0	0.919
3	2	2	3	9	1	0	2	0	0.307
3	2	2	3	10	1	0	3	1	0.370
3	2	2	3	11	1	0	1	0	0.084
3	2	2	3	12	1	0	2	0	0.448
3	2	2	3	13	1	0	2	0	0.220
3	2	2	3	14	1	0	1	0	0.177
3	2	2	3	15	1	0	4	0	0.540
3	2	2	3	16	1	0	1	0	0.404
3	2	2	3	17	1	0	1	0	0.173
3	2	2	3	18	1	0	2	0	0.449
3	2	2	3	19	1	0	2	0	0.414
3	2	2	3	20	1	0	5	0	0.497
3	3	1	1	1	1	0	8	0	1.804
3	3	1	1	2	1	0	3	0	0.273
3	3	1	1	3	1	0	2	0	0.186
3	3	1	1	4	1	0	2	0	0.276
3	3	1	1	5	1	0	3	0	0.179
3	3	1	1	6	1	0	1	0	0.157
3	3	1	1	7	1	0	1	0	0.130
3	3	1	1	8	1	0	3	0	0.345

A	B	C	D	E	F	G	H	I	J
3	3	1	1	9	1	0	1	0	0.037
3	3	1	1	10	1	0	2	0	0.219
3	3	1	1	11	1	0	1	0	0.170
3	3	1	1	12	1	0	7	0	0.964
3	3	1	1	13	1	0	3	0	0.589
3	3	1	1	14	1	0	4	0	1.661
3	3	1	1	15	1	0	4	0	0.622
3	3	1	1	16	1	0	2	0	0.184
3	3	1	1	17	1	0	2	0	0.388
3	3	1	1	18	1	0	1	0	0.836
3	3	1	1	19	1	0	11	0	1.577
3	3	1	1	20	1	0	4	0	0.796
3	3	1	2	1	1	0	1	0	0.163
3	3	1	2	2	1	0	3	0	0.149
3	3	1	2	3	1	0	10	0	0.635
3	3	1	2	4	1	0	7	0	0.481
3	3	1	2	5	1	0	1	0	0.109
3	3	1	2	6	1	0	1	0	0.058
3	3	1	2	7	1	0	3	0	0.133
3	3	1	2	8	1	0	13	0	1.727
3	3	1	2	9	1	0	3	0	0.390
3	3	1	2	10	1	0	1	0	0.043
3	3	1	2	11	1	0	6	0	0.618
3	3	1	2	12	1	0	5	0	0.344
3	3	1	2	13	1	0	16	0	1.393
3	3	1	2	14	1	0	8	0	0.533
3	3	1	2	15	2	8	1	0	0.048
3	3	1	2	16	2	8	2	0	0.047
3	3	1	2	17	2	8	2	0	0.153
3	3	1	2	18	2	8	3	0	0.201
3	3	1	2	19	2	8	2	0	0.169
3	3	1	2	20	2	8	1	0	0.013
3	3	1	3	1	1	0	5	0	0.930
3	3	1	3	2	1	0	2	0	0.133
3	3	1	3	3	1	0	2	0	0.258
3	3	1	3	4	1	0	1	0	0.109
3	3	1	3	5	1	0	1	0	0.262
3	3	1	3	6	1	0	3	0	0.423
3	3	1	3	7	1	0	2	0	0.217
3	3	1	3	8	1	0	5	0	0.858
3	3	1	3	9	1	0	5	0	0.293
3	3	1	3	10	1	0	2	0	0.064
3	3	1	3	11	1	0	3	0	0.473
3	3	1	3	12	1	0	3	0	0.309
3	3	1	3	13	1	0	6	0	1.546
3	3	1	3	14	1	0	2	0	0.357
3	3	1	3	15	1	0	2	0	0.100
3	3	1	3	16	1	0	1	0	0.259
3	3	1	3	17	1	0	3	0	0.529
3	3	1	3	18	1	0	1	0	0.150
3	3	1	3	19	1	0	2	0	0.161
3	3	1	3	20	1	0	4	0	0.819
3	3	2	1	1	1	0	7	0	1.009
3	3	2	1	2	1	0	3	0	0.586
3	3	2	1	3	1	0	2	0	0.675
3	3	2	1	4	1	0	4	0	0.758
3	3	2	1	5	1	0	4	0	0.549
3	3	2	1	6	1	0	1	0	0.804
3	3	2	1	7	1	0	2	0	0.187
3	3	2	1	8	1	0	1	0	0.686
3	3	2	1	9	1	0	1	0	0.161
3	3	2	1	10	1	0	1	0	0.268
3	3	2	1	11	1	0	1	0	0.538
3	3	2	1	12	1	0	1	0	0.401
3	3	2	1	13	1	0	2	0	0.555
3	3	2	1	14	1	0	2	0	0.374
3	3	2	1	15	1	0	2	0	0.327
3	3	2	1	16	1	0	1	0	0.464
3	3	2	1	17	1	0	4	0	1.255
3	3	2	1	18	1	0	3	0	0.526
3	3	2	1	19	1	0	5	0	1.023
3	3	2	1	20	1	0	1	0	0.639
3	3	2	2	1	1	0	1	0	0.313
3	3	2	2	2	1	0	3	0	0.511
3	3	2	2	3	1	0	2	0	0.567
3	3	2	2	4	1	0	2	0	0.438
3	3	2	2	5	1	0	1	0	0.382
3	3	2	2	6	1	0	1	0	0.239
3	3	2	2	7	1	0	1	0	0.137
3	3	2	2	8	1	0	1	0	0.362
3	3	2	2	9	1	0	2	0	0.514
3	3	2	2	10	1	0	6	0	0.629
3	3	2	2	11	1	0	2	0	0.379
3	3	2	2	12	1	0	1	0	0.232
3	3	2	2	13	1	0	1	0	0.408
3	3	2	2	14	1	0	2	0	0.161
3	3	2	2	15	1	0	2	0	0.608
3	3	2	2	16	1	0	1	0	0.321
3	3	2	2	17	1	0	1	0	0.356
3	3	2	2	18	1	0	1	0	0.464
3	3	2	2	19	1	0	2	0	0.970
3	3	2	2	20	1	0	3	0	0.856
3	3	2	3	1	1	0	12	0	1.622
3	3	2	3	2	1	0	3	0	0.740
3	3	2	3	3	1	0	1	0	0.469
3	3	2	3	4	1	0	3	0	0.317
3	3	2	3	5	1	0	2	0	0.210
3	3	2	3	6	1	0	1	0	0.053
3	3	2	3	7	1	0	2	0	0.243
3	3	2	3	8	1	0	5	0	0.426
3	3	2	3	9	1	0	1	0	0.038
3	3	2	3	10	1	0	2	0	0.118
3	3	2	3	11	1	0	3	0	0.583
3	3	2	3	12	1	0	2	0	0.257
3	3	2	3	13	1	0	2	0	0.515
3	3	2	3	14	1	0	1	0	0.108
3	3	2	3	15	1	0	1	0	0.404
3	3	2	3	16	1	0	3	0	0.399
3	3	2	3	17	1	0	2	0	0.377
3	3	2	3	18	1	0	5	0	0.440
3	3	2	3	19	1	0	4	0	0.895
3	3	2	3	20	1	0	3	0	0.518
3	4	1	1	1	1	0	4	0	0.214
3	4	1	1	2	1	0	3	0	0.290
3	4	1	1	3	1	0	10	0	2.170
3	4	1	1	4	1	0	2	0	0.481
3	4	1	1	5	1	0	2	0	0.555
3	4	1	1	6	1	0	1	0	0.358
3	4	1	1	7	1	0	8	0	0.854
3	4	1	1	8	1	0	2	2	1.395
3	4	1	1	9	1	0	2	0	0.478
3	4	1	1	10	1	0	4	0	0.481
3	4	1	1	11	1	0	2	0	0.255
3	4	1	1	12	1	0	2	0	0.503
3	4	1	1	13	1	0	4	0	0.940
3	4	1	1	14	1	0	1	0	0.352
3	4	1	1	15	1	0	2	0	0.511
3	4	1	1	16	1	0	5	0	0.836
3	4	1	1	17	1	0	6	0	0.570
3	4	1	1	18	1	0	2	0	0.241
3	4	1	1	19	1	0	1	0	0.337
3	4	1	1	20	1	0	2	0	0.644

A	B	C	D	E	F	G	H	I	J
3	4	1	2	1	1	0	2	0	0.536
3	4	1	2	2	1	0	2	0	1.118
3	4	1	2	3	1	0	4	0	0.606
3	4	1	2	4	1	0	2	0	0.397
3	4	1	2	5	1	0	3	1	0.885
3	4	1	2	6	1	0	3	0	0.747
3	4	1	2	7	1	0	2	0	0.874
3	4	1	2	8	1	0	4	0	0.803
3	4	1	2	9	1	0	5	0	0.923
3	4	1	2	10	1	0	5	0	1.370
3	4	1	2	11	1	0	4	0	1.192
3	4	1	2	12	1	0	6	0	1.438
3	4	1	2	13	1	0	2	0	0.442
3	4	1	2	14	1	0	3	0	0.780
3	4	1	2	15	1	0	3	0	0.905
3	4	1	2	16	1	0	5	0	0.536
3	4	1	2	17	1	0	8	0	1.192
3	4	1	2	18	1	0	2	0	0.999
3	4	1	2	19	1	0	1	0	0.371
3	4	1	2	20	1	0	4	0	0.872
3	4	1	3	1	1	0	5	0	1.290
3	4	1	3	2	1	0	4	0	0.744
3	4	1	3	3	1	0	4	0	0.525
3	4	1	3	4	1	0	3	0	0.509
3	4	1	3	5	1	0	1	0	0.234
3	4	1	3	6	1	0	6	0	0.766
3	4	1	3	7	1	0	3	0	0.242
3	4	1	3	8	1	0	3	0	0.588
3	4	1	3	9	1	0	5	0	1.548
3	4	1	3	10	1	0	2	0	0.448
3	4	1	3	11	1	0	1	0	0.033
3	4	1	3	12	1	0	4	0	0.994
3	4	1	3	13	1	0	2	0	0.626
3	4	1	3	14	1	0	5	1	2.056
3	4	1	3	15	1	0	4	0	0.739
3	4	1	3	16	1	0	6	0	1.382
3	4	1	3	17	1	0	2	0	0.597
3	4	1	3	18	1	0	2	0	0.912
3	4	1	3	19	1	0	2	1	0.888
3	4	1	3	20	1	0	4	0	1.238
3	4	2	1	1	1	0	1	1	1.028
3	4	2	1	2	1	0	3	0	1.005
3	4	2	1	3	1	0	3	0	0.869
3	4	2	1	4	1	0	2	0	0.747
3	4	2	1	5	1	0	1	0	0.135
3	4	2	1	6	1	0	6	0	1.550
3	4	2	1	7	1	0	3	0	2.574
3	4	2	1	8	1	0	1	0	0.856
3	4	2	1	9	1	0	3	0	1.338
3	4	2	1	10	1	0	4	0	1.702
3	4	2	1	11	1	0	1	0	0.744
3	4	2	1	12	1	0	2	0	1.119
3	4	2	1	13	1	0	1	0	1.379
3	4	2	1	14	1	0	2	0	0.717
3	4	2	1	15	1	0	1	0	0.543
3	4	2	1	16	1	0	3	0	0.958
3	4	2	1	17	1	0	1	0	0.474
3	4	2	1	18	1	0	1	0	0.439
3	4	2	1	19	1	0	1	0	0.793
3	4	2	1	20	1	0	2	0	0.717
3	4	2	2	1	1	0	1	0	0.161
3	4	2	2	2	1	0	2	0	0.674
3	4	2	2	3	1	0	1	0	0.562
3	4	2	2	4	1	0	1	0	0.663
3	4	2	2	5	1	0	2	0	0.872
3	4	2	2	6	1	0	3	0	1.531

A	B	C	D	E	F	G	H	I	J
3	4	2	2	7	1	0	2	0	0.340
3	4	2	2	8	1	0	4	0	1.137
3	4	2	2	9	1	0	8	0	1.665
3	4	2	2	10	1	0	4	0	0.844
3	4	2	2	11	1	0	4	0	0.349
3	4	2	2	12	1	0	6	0	0.969
3	4	2	2	13	1	0	3	0	0.542
3	4	2	2	14	1	0	3	0	0.446
3	4	2	2	15	1	0	2	0	0.468
3	4	2	2	16	1	0	4	0	0.590
3	4	2	2	17	1	0	4	1	0.817
3	4	2	2	18	1	0	1	0	0.910
3	4	2	2	19	1	0	2	0	0.369
3	4	2	2	20	1	0	5	0	0.748
3	4	2	3	1	1	0	4	0	0.410
3	4	2	3	2	1	0	3	0	0.384
3	4	2	3	3	1	0	1	0	0.376
3	4	2	3	4	1	0	1	0	0.727
3	4	2	3	5	1	0	2	0	0.582
3	4	2	3	6	1	0	1	0	0.461
3	4	2	3	7	1	0	3	0	0.367
3	4	2	3	8	1	0	2	0	1.213
3	4	2	3	9	1	0	5	0	0.553
3	4	2	3	10	1	0	5	0	0.764
3	4	2	3	11	1	0	4	0	0.512
3	4	2	3	12	1	0	5	0	0.348
3	4	2	3	13	1	0	3	0	0.390
3	4	2	3	14	1	0	3	1	1.049
3	4	2	3	15	1	0	1	0	0.337
3	4	2	3	16	1	0	4	0	0.381
3	4	2	3	17	1	0	4	0	1.104
3	4	2	3	18	1	0	1	0	0.148
3	4	2	3	19	1	0	4	0	0.603
3	4	2	3	20	1	0	3	0	0.523
3	5	1	1	1	1	0	9	0	1.698
3	5	1	1	2	1	0	5	0	0.843
3	5	1	1	3	1	0	3	0	0.491
3	5	1	1	4	1	0	3	0	0.495
3	5	1	1	5	1	0	4	0	0.321
3	5	1	1	6	1	0	2	0	0.234
3	5	1	1	7	1	0	4	0	0.402
3	5	1	1	8	1	0	1	0	0.050
3	5	1	1	9	1	0	1	0	0.098
3	5	1	1	10	1	0	1	0	0.059
3	5	1	1	11	1	0	5	0	0.536
3	5	1	1	12	1	0	5	0	0.329
3	5	1	1	13	1	0	1	0	0.149
3	5	1	1	14	1	0	2	0	0.218
3	5	1	1	15	1	0	3	0	0.634
3	5	1	1	16	1	0	4	0	0.409
3	5	1	1	17	1	0	7	0	0.741
3	5	1	1	18	1	0	6	0	0.724
3	5	1	1	19	1	0	3	0	0.420
3	5	1	1	20	1	0	6	0	0.429
3	5	1	2	1	1	0	5	0	0.390
3	5	1	2	2	1	0	5	0	0.347
3	5	1	2	3	1	0	2	0	0.223
3	5	1	2	4	1	0	4	0	0.374
3	5	1	2	5	1	0	2	0	0.127
3	5	1	2	6	1	0	5	0	0.437
3	5	1	2	7	1	0	4	0	0.382
3	5	1	2	8	1	0	4	0	0.393
3	5	1	2	9	1	0	8	0	0.877
3	5	1	2	10	1	0	4	0	0.317
3	5	1	2	11	1	0	4	0	0.449
3	5	1	2	12	1	0	3	0	0.155

A	B	C	D	E	F	G	H	I	J
3	5	1	2	13	1	0	3	0	0.586
3	5	1	2	14	1	0	8	0	0.975
3	5	1	2	15	1	0	10	0	0.635
3	5	1	2	16	1	0	2	0	0.354
3	5	1	2	17	1	0	3	0	0.205
3	5	1	2	18	1	0	1	0	0.237
3	5	1	2	19	1	0	1	0	0.117
3	5	1	2	20	1	0	4	0	0.383
3	5	1	3	1	1	0	4	0	0.401
3	5	1	3	2	1	0	2	0	0.144
3	5	1	3	3	1	0	4	0	0.239
3	5	1	3	4	1	0	4	0	0.208
3	5	1	3	5	1	0	3	0	0.226
3	5	1	3	6	1	0	5	0	0.629
3	5	1	3	7	1	0	20	0	2.287
3	5	1	3	8	1	0	3	0	0.115
3	5	1	3	9	1	0	4	0	0.295
3	5	1	3	10	1	0	8	0	0.751
3	5	1	3	11	1	0	3	0	0.620
3	5	1	3	12	1	0	10	0	0.661
3	5	1	3	13	1	0	6	0	0.849
3	5	1	3	14	1	0	6	1	0.963
3	5	1	3	15	1	0	6	0	1.706
3	5	1	3	16	1	0	6	0	0.391
3	5	1	3	17	1	0	4	0	0.170
3	5	1	3	18	1	0	1	0	0.098
3	5	1	3	19	1	0	18	0	1.357
3	5	1	3	20	1	0	6	0	0.886
3	5	2	1	1	1	0	4	0	0.699
3	5	2	1	2	1	0	3	0	0.565
3	5	2	1	3	1	0	7	0	0.716
3	5	2	1	4	1	0	8	0	0.649
3	5	2	1	5	1	0	3	0	0.201
3	5	2	1	6	1	0	1	0	0.112
3	5	2	1	7	1	0	2	0	0.180
3	5	2	1	8	1	0	5	0	0.453
3	5	2	1	9	1	0	5	0	0.522
3	5	2	1	10	1	0	3	0	0.226
3	5	2	1	11	1	0	1	0	0.042
3	5	2	1	12	1	0	4	0	0.338
3	5	2	1	13	1	0	4	0	0.402
3	5	2	1	14	1	0	2	0	0.157
3	5	2	1	15	1	0	4	0	0.314
3	5	2	1	16	1	0	2	0	0.120
3	5	2	1	17	1	0	3	0	0.149
3	5	2	1	18	1	0	4	0	0.157
3	5	2	1	19	1	0	5	0	0.697
3	5	2	1	20	1	0	7	0	0.374
3	5	2	2	1	1	0	2	0	0.115
3	5	2	2	2	1	0	4	0	0.527
3	5	2	2	3	1	0	6	0	0.522
3	5	2	2	4	1	0	2	0	0.422
3	5	2	2	5	1	0	3	0	0.271
3	5	2	2	6	1	0	3	0	0.434
3	5	2	2	7	1	0	4	0	0.328
3	5	2	2	8	1	0	5	0	0.626
3	5	2	2	9	1	0	2	0	0.113
3	5	2	2	10	1	0	2	0	0.126
3	5	2	2	11	1	0	2	0	0.159
3	5	2	2	12	1	0	1	0	0.118
3	5	2	2	13	1	0	1	0	0.120
3	5	2	2	14	1	0	1	0	0.215
3	5	2	2	15	1	0	1	0	0.175
3	5	2	2	16	1	0	3	0	0.281
3	5	2	2	17	1	0	4	0	0.787
3	5	2	2	18	1	0	2	0	0.242

A	B	C	D	E	F	G	H	I	J
3	5	2	2	19	1	0	2	0	0.288
3	5	2	2	20	1	0	3	1	0.731
3	5	2	3	1	1	0	5	0	0.923
3	5	2	3	2	1	0	4	0	0.258
3	5	2	3	3	1	0	5	0	0.202
3	5	2	3	4	1	0	4	0	0.227
3	5	2	3	5	1	0	4	0	0.144
3	5	2	3	6	1	0	3	0	0.179
3	5	2	3	7	1	0	3	0	0.151
3	5	2	3	8	1	0	1	0	0.052
3	5	2	3	9	1	0	1	0	0.048
3	5	2	3	10	1	0	2	0	0.128
3	5	2	3	11	1	0	5	0	0.419
3	5	2	3	12	1	0	6	0	0.760
3	5	2	3	13	1	0	3	0	0.210
3	5	2	3	14	1	0	2	0	0.096
3	5	2	3	15	1	0	2	0	0.101
3	5	2	3	16	1	0	4	0	0.149
3	5	2	3	17	1	0	1	0	0.077
3	5	2	3	18	1	0	4	0	0.176
3	5	2	3	19	1	0	2	0	0.156
3	5	2	3	20	1	0	3	0	0.199
4	1	1	1	1	1	0	4	0	0.008
4	1	1	1	2	2	8	4	0	0.017
4	1	1	1	3	2	8	2	0	0.004
4	1	1	1	4	2	8	6	0	0.027
4	1	1	1	5	2	8	5	0	0.017
4	1	1	1	6	2	8	5	0	0.016
4	1	1	1	7	2	8	4	0	0.005
4	1	1	1	8	2	8	1	0	0.003
4	1	1	1	9	2	8	2	0	0.015
4	1	1	1	10	2	8	5	0	0.005
4	1	1	1	11	2	8	3	0	0.003
4	1	1	1	12	2	8	3	0	0.024
4	1	1	1	13	2	8	2	0	0.006
4	1	1	1	14	2	8	1	0	0.003
4	1	1	1	15	2	8	2	0	0.006
4	1	1	2	1	2	8	3	0	0.008
4	1	1	2	2	2	8	1	0	0.005
4	1	1	2	3	2	8	1	0	0.004
4	1	1	2	4	2	8	2	0	0.009
4	1	1	2	5	2	8	3	0	0.006
4	1	1	2	6	2	8	2	0	0.009
4	1	1	2	7	2	8	3	0	0.004
4	1	1	2	8	2	8	3	0	0.010
4	1	1	2	9	2	8	5	0	0.017
4	1	1	2	10	2	8	3	0	0.007
4	1	1	2	11	2	8	1	0	0.004
4	1	1	2	12	3	21	1	0	0.005
4	1	1	3	1	2	8	5	0	0.011
4	1	1	3	2	3	21	1	0	0.007
4	1	1	3	3	3	21	1	0	0.007
4	1	1	3	4	2	8	4	0	0.009
4	1	1	3	5	3	21	3	0	0.009
4	1	1	3	6	2	8	4	0	0.020
4	1	2	1	1	2	8	3	0	0.019
4	1	2	1	2	2	8	8	0	0.025
4	1	2	1	3	1	0	8	0	0.029
4	1	2	1	4	2	8	4	0	0.023
4	1	2	1	5	2	8	5	0	0.029
4	1	2	1	6	2	8	8	0	0.037
4	1	2	1	7	2	8	3	0	0.011
4	1	2	1	8	2	8	2	0	0.012
4	1	2	1	9	2	8	5	0	0.031
4	1	2	1	10	2	8	2	0	0.004
4	1	2	1	11	2	8	3	0	0.010

A	B	C	D	E	F	G	H	I	J
4	1	2	1	12	2	8	2	0	0.006
4	1	2	1	13	2	8	4	0	0.017
4	1	2	1	14	1	0	7	0	0.038
4	1	2	1	15	3	21	2	0	0.003
4	1	2	1	16	2	8	5	0	0.021
4	1	2	1	17	1	0	6	0	0.039
4	1	2	1	18	1	0	4	0	0.007
4	1	2	1	19	2	8	8	0	0.010
4	1	2	1	20	1	0	6	0	0.031
4	1	2	2	1	2	8	2	0	0.003
4	1	2	2	2	2	8	3	0	0.007
4	1	2	2	3	2	8	3	0	0.005
4	1	2	2	4	1	0	7	0	0.020
4	1	2	2	5	2	8	1	0	0.002
4	1	2	2	6	2	8	2	0	0.007
4	1	2	2	7	1	0	2	0	0.014
4	1	2	2	8	2	8	1	0	0.004
4	1	2	2	9	2	8	2	0	0.004
4	1	2	2	10	2	8	2	0	0.007
4	1	2	2	11	2	8	3	0	0.009
4	1	2	2	12	2	8	3	0	0.006
4	1	2	2	13	2	8	2	0	0.009
4	1	2	2	14	2	8	5	0	0.012
4	1	2	3	1	2	8	6	0	0.030
4	1	2	3	2	2	8	7	0	0.033
4	1	2	3	3	2	8	3	0	0.008
4	1	2	3	4	2	8	5	0	0.015
4	1	2	3	5	2	8	7	0	0.032
4	1	2	3	6	2	8	7	0	0.021
4	1	2	3	7	2	8	4	0	0.015
4	1	2	3	8	2	8	1	0	0.004
4	1	2	3	9	2	8	1	0	0.003
4	1	2	3	10	2	8	6	0	0.016
4	1	2	3	11	2	8	5	0	0.050
4	1	2	3	12	2	8	1	0	0.010
4	1	2	3	13	2	8	5	0	0.029
4	1	2	3	14	2	8	4	0	0.022
4	1	2	3	15	2	8	4	0	0.018
4	1	2	3	16	2	8	6	0	0.027
4	1	2	3	17	2	8	7	0	0.033
4	1	2	3	18	2	8	8	0	0.066
4	1	2	3	19	2	8	4	0	0.028
4	1	2	3	20	2	8	3	0	0.012
4	2	1	1	1	2	8	4	0	0.005
4	2	1	1	2	2	8	5	0	0.021
4	2	1	1	3	2	8	7	0	0.021
4	2	1	1	4	2	8	6	0	0.013
4	2	1	1	5	2	8	3	0	0.004
4	2	1	1	6	2	8	4	0	0.008
4	2	1	1	7	2	8	4	0	0.007
4	2	1	1	8	2	8	6	0	0.008
4	2	1	1	9	2	8	3	0	0.007
4	2	1	2	1	2	8	2	0	0.003
4	2	1	2	2	3	21	2	0	0.002
4	2	1	2	3	2	8	2	0	0.004
4	2	1	2	4	2	8	2	0	0.005
4	2	1	2	5	2	8	2	0	0.006
4	2	1	2	6	2	8	2	0	0.005
4	2	1	2	7	3	21	1	0	0.005
4	2	1	2	8	2	8	3	0	0.007
4	2	1	2	9	3	21	1	0	0.002
4	2	1	2	10	2	8	3	0	0.009
4	2	1	2	11	3	21	3	0	0.007
4	2	1	2	12	2	8	1	0	0.003
4	2	1	2	13	2	8	1	0	0.003
4	2	1	3	1	2	8	4	0	0.011
4	2	1	3	2	2	8	3	0	0.050
4	2	1	3	3	2	8	4	0	0.017
4	2	1	3	4	2	8	2	0	0.004
4	2	1	3	5	3	21	2	0	0.004
4	2	1	3	6	2	8	2	0	0.005
4	2	1	3	7	2	8	3	0	0.012
4	2	1	3	8	2	8	1	0	0.003
4	2	1	3	9	2	8	2	0	0.005
4	2	2	1	1	3	21	7	0	0.027
4	2	2	1	2	3	21	7	0	0.019
4	2	2	1	3	3	21	7	0	0.025
4	2	2	1	4	1	0	5	0	0.024
4	2	2	1	5	2	8	7	0	0.017
4	2	2	1	6	1	0	9	0	0.064
4	2	2	1	7	2	8	5	0	0.023
4	2	2	1	8	2	8	6	0	0.012
4	2	2	1	9	2	8	7	0	0.023
4	2	2	1	10	1	0	7	0	0.028
4	2	2	1	11	2	8	3	0	0.012
4	2	2	1	12	2	8	5	0	0.011
4	2	2	1	13	1	0	6	0	0.028
4	2	2	1	14	1	0	8	0	0.076
4	2	2	2	1	1	0	6	0	0.018
4	2	2	2	2	2	8	3	0	0.011
4	2	2	2	3	2	8	4	0	0.018
4	2	2	2	4	2	8	3	0	0.012
4	2	2	2	5	2	8	5	0	0.017
4	2	2	2	6	2	8	4	0	0.022
4	2	2	2	7	2	8	4	0	0.024
4	2	2	2	8	1	0	4	0	0.027
4	2	2	2	9	2	8	3	0	0.010
4	2	2	2	10	1	0	7	0	0.030
4	2	2	2	11	1	0	3	0	0.004
4	2	2	2	12	2	8	2	0	0.004
4	2	2	2	13	2	8	2	0	0.005
4	2	2	2	14	2	8	1	0	0.008
4	2	2	2	15	1	0	6	0	0.027
4	2	2	3	1	2	8	5	0	0.028
4	2	2	3	2	2	8	5	0	0.021
4	2	2	3	3	1	0	6	0	0.030
4	2	2	3	4	1	0	5	0	0.023
4	2	2	3	5	2	8	2	0	0.019
4	2	2	3	6	1	0	5	0	0.028
4	2	2	3	7	2	8	5	0	0.027
4	2	2	3	8	1	0	9	0	0.053
4	2	2	3	9	3	21	2	0	0.005
4	2	2	3	10	2	8	7	0	0.034
4	2	2	3	11	2	8	2	0	0.015
4	2	2	3	12	2	8	5	0	0.030
4	2	2	3	13	2	8	5	0	0.020
4	2	2	3	14	2	8	3	0	0.012
4	2	2	3	15	1	0	5	0	0.045
4	2	2	3	16	2	8	4	0	0.020
4	2	2	3	17	2	8	6	0	0.023
4	2	2	3	18	2	8	3	0	0.014
4	2	2	3	19	2	8	3	0	0.015
4	2	2	3	20	1	0	3	0	0.014
4	3	1	1	1	2	8	3	0	0.008
4	3	1	1	2	2	8	2	0	0.007
4	3	1	1	3	2	8	4	0	0.014
4	3	1	1	4	2	8	1	0	0.001
4	3	1	1	5	2	8	3	0	0.005
4	3	1	2	1	3	21	2	0	0.004
4	3	1	2	2	3	21	2	0	0.001
4	3	2	1	1	2	8	3	0	0.014
4	3	2	1	2	2	8	3	0	0.016

A	B	C	D	E	F	G	H	I	J
4	3	2	1	3	2	8	3	0	0.018
4	3	2	1	4	2	8	2	0	0.008
4	3	2	1	5	2	8	3	0	0.013
4	3	2	1	6	2	8	3	0	0.013
4	3	2	1	7	2	8	5	0	0.019
4	3	2	1	8	2	8	4	0	0.021
4	3	2	2	1	1	0	7	0	0.025
4	3	2	2	2	2	8	5	0	0.021
4	3	2	2	3	2	8	3	0	0.009
4	3	2	2	4	2	8	4	0	0.013
4	3	2	2	5	2	8	2	0	0.011
4	3	2	2	6	2	8	7	0	0.036
4	3	2	2	7	2	8	7	0	0.044
4	3	2	2	8	2	8	7	0	0.026
4	3	2	2	9	3	21	6	0	0.033
4	3	2	3	1	2	8	5	0	0.027
4	3	2	3	2	2	8	2	0	0.007
4	3	2	3	3	2	8	2	0	0.009
4	3	2	3	4	3	21	1	0	0.001
4	3	2	3	5	2	8	3	0	0.007
4	3	2	3	6	2	8	2	0	0.007
4	3	2	3	7	3	21	2	0	0.004
4	3	2	3	8	2	8	2	0	0.003
4	3	2	3	9	1	0	2	0	0.009
4	3	2	3	10	2	8	1	0	0.002
4	3	2	3	11	2	8	3	0	0.004
4	3	2	3	12	2	8	3	0	0.011
4	3	2	3	13	2	8	6	0	0.042
4	3	2	3	14	2	8	2	0	0.005
4	3	2	3	15	2	8	3	0	0.015
4	3	2	3	16	2	8	1	0	0.001
4	3	2	3	17	2	8	4	0	0.013
4	3	2	3	18	2	8	7	0	0.031
4	4	1	1	1	2	8	3	0	0.018
4	4	1	1	2	1	0	3	0	0.009
4	4	1	1	3	2	8	2	0	0.006
4	4	1	1	4	2	8	4	0	0.009
4	4	1	1	5	2	8	5	0	0.013
4	4	1	1	6	2	8	7	0	0.019
4	4	1	1	7	2	8	4	0	0.011
4	4	1	1	8	2	8	4	0	0.011
4	4	1	1	9	2	8	2	0	0.000
4	4	1	2	1	3	21	1	0	0.004
4	4	1	2	2	3	21	1	0	0.005
4	4	1	2	3	3	21	1	0	0.003
4	4	1	2	4	2	8	2	0	0.005
4	4	1	2	5	3	21	2	0	0.010
4	4	1	3	1	2	8	3	0	0.011
4	4	1	3	2	2	8	1	0	0.008
4	4	1	3	3	3	21	1	0	0.003
4	4	1	3	4	2	8	4	0	0.017
4	4	1	3	5	2	8	3	0	0.013
4	4	1	3	6	2	8	2	0	0.014
4	4	1	3	7	2	8	1	0	0.005
4	4	1	3	8	2	8	2	0	0.010
4	4	1	3	9	1	0	4	0	0.016
4	4	1	3	10	1	0	3	0	0.010
4	4	1	3	11	3	21	1	0	0.008
4	4	1	3	12	2	8	4	0	0.014
4	4	1	3	13	2	8	3	0	0.012
4	4	1	3	14	2	8	1	0	0.007
4	4	1	3	15	2	8	2	0	0.008
4	4	1	3	16	2	8	1	0	0.011
4	4	1	3	17	2	8	3	0	0.020
4	4	1	3	18	2	8	2	0	0.007
4	4	1	3	19	2	8	3	0	0.013
4	4	1	3	20	2	8	2	0	0.006
4	4	2	1	1	2	8	6	0	0.029
4	4	2	1	2	2	8	7	0	0.032
4	4	2	1	3	2	8	7	0	0.037
4	4	2	1	4	1	0	10	0	0.082
4	4	2	1	5	3	21	4	0	0.024
4	4	2	1	6	2	8	6	0	0.029
4	4	2	1	7	2	8	4	0	0.024
4	4	2	1	8	2	8	3	0	0.013
4	4	2	1	9	2	8	4	0	0.017
4	4	2	1	10	1	0	7	0	0.056
4	4	2	1	11	2	8	3	0	0.016
4	4	2	1	12	2	8	7	0	0.036
4	4	2	1	13	2	8	9	0	0.050
4	4	2	1	14	2	8	9	0	0.042
4	4	2	1	15	1	0	10	0	0.058
4	4	2	1	16	2	8	2	0	0.009
4	4	2	1	17	2	8	3	0	0.022
4	4	2	1	18	2	8	8	0	0.041
4	4	2	1	19	2	8	4	0	0.031
4	4	2	1	20	2	8	8	0	0.057
4	4	2	2	1	1	0	8	0	0.032
4	4	2	2	2	2	8	2	0	0.008
4	4	2	2	3	2	8	4	0	0.012
4	4	2	2	4	2	8	3	0	0.016
4	4	2	2	5	2	8	3	0	0.023
4	4	2	2	6	1	0	6	0	0.034
4	4	2	2	7	2	8	4	0	0.011
4	4	2	2	8	2	8	4	0	0.021
4	4	2	2	9	1	0	9	0	0.043
4	4	2	2	10	2	8	7	0	0.043
4	4	2	2	11	1	0	6	0	0.027
4	4	2	2	12	2	8	2	0	0.014
4	4	2	2	13	2	8	4	0	0.020
4	4	2	2	14	1	0	6	0	0.029
4	4	2	2	15	2	8	3	0	0.011
4	4	2	2	16	2	8	4	0	0.013
4	4	2	2	17	1	0	6	0	0.043
4	4	2	2	18	2	8	3	0	0.011
4	4	2	2	19	2	8	4	0	0.019
4	4	2	2	20	2	8	5	0	0.023
4	4	2	3	1	2	8	6	0	0.022
4	4	2	3	2	2	8	6	0	0.021
4	4	2	3	3	2	8	3	0	0.012
4	4	2	3	4	1	0	4	0	0.017
4	4	2	3	5	2	8	6	0	0.025
4	4	2	3	6	2	8	5	0	0.022
4	4	2	3	7	2	8	3	0	0.015
4	4	2	3	8	2	8	7	0	0.043
4	4	2	3	9	1	0	15	0	0.078
4	4	2	3	10	2	8	6	0	0.026
4	4	2	3	11	1	0	6	0	0.022
4	4	2	3	12	1	0	5	0	0.017
4	4	2	3	13	2	8	6	0	0.022
4	4	2	3	14	1	0	8	0	0.034
4	4	2	3	15	2	8	3	0	0.008
4	4	2	3	16	2	8	3	0	0.016
4	4	2	3	17	2	8	3	0	0.013
4	4	2	3	18	2	8	3	0	0.023
4	4	2	3	19	2	8	3	0	0.011
4	4	2	3	20	2	8	5	0	0.015
4	5	1	1	1	3	21	1	0	0.002
4	5	1	1	2	3	21	1	0	0.004
4	5	1	1	3	3	21	1	0	0.002
4	5	1	1	4	3	21	2	0	0.007
4	5	1	1	5	2	8	2	0	0.004

A	B	C	D	E	F	G	H	I	J
4	5	1	1	6	2	8	1	0	0.005
4	5	1	2	1	3	21	1	0	0.005
4	5	1	2	2	2	8	2	0	0.005
4	5	1	2	3	2	8	2	0	0.006
4	5	1	2	4	3	21	1	0	0.003
4	5	1	2	5	3	21	1	0	0.000
4	5	1	2	6	3	21	1	0	0.001
4	5	1	2	7	3	21	1	0	0.001
4	5	1	2	8	3	21	1	0	0.002
4	5	1	3	1	3	21	2	0	0.007
4	5	1	3	2	2	8	1	0	0.002
4	5	1	3	3	3	21	1	0	0.002
4	5	1	3	4	3	21	1	0	0.003
4	5	1	3	5	3	21	1	0	0.001
4	5	2	1	1	2	8	5	0	0.008
4	5	2	1	2	2	8	8	0	0.036
4	5	2	1	3	2	8	11	0	0.049
4	5	2	1	4	2	8	8	0	0.034
4	5	2	1	5	2	8	9	0	0.035
4	5	2	1	6	2	8	4	0	0.018
4	5	2	1	7	2	8	6	0	0.034
4	5	2	1	8	2	8	8	0	0.029
4	5	2	1	9	2	8	11	0	0.075
4	5	2	2	1	2	8	2	0	0.007
4	5	2	2	2	2	8	3	0	0.020
4	5	2	2	3	2	8	3	0	0.023
4	5	2	2	4	2	8	6	0	0.032
4	5	2	2	5	2	8	2	0	0.018
4	5	2	2	6	2	8	3	0	0.013
4	5	2	2	7	2	8	6	0	0.026
4	5	2	2	8	2	8	6	0	0.037
4	5	2	2	9	2	8	5	0	0.025
4	5	2	2	10	2	8	6	0	0.024
4	5	2	2	11	2	8	4	0	0.012
4	5	2	2	12	1	0	4	0	0.018
4	5	2	2	13	1	0	4	0	0.021
4	5	2	2	14	1	0	5	0	0.016
4	5	2	3	1	2	8	3	0	0.020
4	5	2	3	2	2	8	7	0	0.031
4	5	2	3	3	2	8	8	0	0.017
4	5	2	3	4	2	8	6	0	0.034
4	5	2	3	5	2	8	7	0	0.020
4	5	2	3	6	2	8	5	0	0.012
4	5	2	3	7	2	8	7	0	0.022
4	5	2	3	8	2	8	3	0	0.011
4	5	2	3	9	2	8	7	0	0.017
4	5	2	3	10	2	8	3	0	0.016
4	5	2	3	11	2	8	5	0	0.012
4	5	2	3	12	2	8	6	0	0.023
4	5	2	3	13	2	8	4	0	0.013
4	5	2	3	14	2	8	7	0	0.020
4	5	2	3	15	2	8	2	0	0.003
4	5	2	3	16	2	8	3	0	0.006
4	5	2	3	17	2	8	8	0	0.021
4	5	2	3	18	2	8	8	0	0.018
4	5	2	3	19	2	8	3	0	0.007
4	5	2	3	20	2	8	4	0	0.023
5	1	1	1	1	1	0	21	0	0.218
5	1	1	1	2	3	21	7	0	0.069
5	1	1	1	3	1	0	37	0	0.436
5	1	1	1	4	3	21	11	0	0.086
5	1	1	1	5	3	21	14	0	0.121
5	1	1	1	6	3	21	7	0	0.083
5	1	1	1	7	3	21	6	0	0.044
5	1	1	1	8	1	0	42	0	0.517
5	1	1	1	9	3	21	27	0	0.263
5	1	1	1	10	3	21	9	0	0.074
5	1	1	2	1	3	21	2	0	0.018
5	1	1	2	2	5	43	2	0	0.007
5	1	1	2	3	3	21	8	0	0.066
5	1	1	2	4	1	0	4	0	0.029
5	1	1	3	1	3	21	12	0	0.199
5	1	1	3	2	6	51	1	0	0.002
5	1	1	3	3	3	21	11	0	0.100
5	1	1	3	4	3	21	7	0	0.081
5	1	1	3	5	1	0	17	0	0.163
5	1	1	3	6	1	0	13	0	0.264
5	1	1	3	7	1	0	24	0	0.349
5	1	1	3	8	3	21	8	0	0.085
5	1	2	1	1	1	0	32	0	0.535
5	1	2	1	2	1	0	42	0	0.451
5	1	2	1	3	3	21	11	0	0.060
5	1	2	1	4	3	21	20	0	0.087
5	1	2	1	5	1	0	20	0	0.143
5	1	2	1	6	3	21	12	0	0.061
5	1	2	1	7	1	0	16	0	0.088
5	1	2	1	8	1	0	17	0	0.062
5	1	2	1	9	1	0	14	0	0.073
5	1	2	1	10	1	0	18	0	0.084
5	1	2	2	1	1	0	25	0	0.145
5	1	2	2	2	3	21	7	0	0.041
5	1	2	2	3	1	0	10	0	0.078
5	1	2	2	4	1	0	19	0	0.142
5	1	2	2	5	1	0	17	0	0.168
5	1	2	2	6	1	0	12	0	0.151
5	1	2	2	7	1	0	11	0	0.102
5	1	2	3	1	2	8	21	0	0.095
5	1	2	3	2	1	0	7	0	0.038
5	1	2	3	3	4	29	8	0	0.061
5	1	2	3	4	1	0	22	0	0.175
5	1	2	3	5	2	8	12	0	0.087
5	1	2	3	6	3	21	16	0	0.081
5	2	1	1	1	3	21	13	0	0.054
5	2	1	1	2	1	0	35	0	0.288
5	2	1	1	3	3	21	9	0	0.089
5	2	1	1	4	4	29	3	0	0.016
5	2	1	2	1	3	21	10	0	0.114
5	2	1	2	2	1	0	7	0	0.048
5	2	1	2	3	3	21	7	0	0.057
5	2	1	2	4	1	0	24	0	0.263
5	2	1	2	5	1	0	3	0	0.016
5	2	1	3	1	3	21	6	0	0.041
5	2	1	3	2	1	0	12	0	0.173
5	2	1	3	3	3	21	9	0	0.086
5	2	1	3	4	3	21	12	0	0.091
5	2	1	3	5	3	21	10	0	0.188
5	2	1	3	6	1	0	40	0	0.552
5	2	2	1	1	3	21	18	0	0.180
5	2	2	1	2	3	21	7	0	0.047
5	2	2	1	3	1	0	16	0	0.145
5	2	2	1	4	3	21	19	0	0.145
5	2	2	1	5	1	0	32	0	0.326
5	2	2	1	6	2	8	24	0	0.257
5	2	2	1	7	3	21	6	0	0.062
5	2	2	1	8	1	0	36	0	0.384
5	2	2	1	9	3	21	27	0	0.439
5	2	2	2	1	1	0	9	0	0.061
5	2	2	2	2	3	21	15	0	0.078
5	2	2	2	3	3	21	11	0	0.093
5	2	2	2	4	3	21	6	0	0.058
5	2	2	2	5	3	21	18	0	0.121
5	2	2	2	6	1	0	15	0	0.209

A	B	C	D	E	F	G	H	I	J
5	2	2	2	7	3	21	8	0	0.076
5	2	2	2	8	3	21	9	0	0.052
5	2	2	2	9	1	0	29	0	0.239
5	2	2	2	10	3	21	7	0	0.094
5	2	2	3	1	1	0	14	0	0.180
5	2	2	3	2	2	8	21	0	0.095
5	2	2	3	3	1	0	20	0	0.085
5	2	2	3	4	3	21	12	0	0.071
5	2	2	3	5	2	8	20	0	0.277
5	2	2	3	6	1	0	30	0	0.229
5	3	1	1	1	3	21	4	0	0.034
5	3	1	1	2	3	21	18	0	0.099
5	3	1	1	3	3	21	18	0	0.194
5	3	1	1	4	5	43	1	0	0.008
5	3	1	1	5	3	21	11	0	0.050
5	3	1	1	6	3	21	7	0	0.137
5	3	1	1	7	3	21	18	0	0.132
5	3	1	2	1	5	43	1	0	0.002
5	3	1	2	2	1	0	13	0	0.064
5	3	1	2	3	3	21	2	0	0.007
5	3	1	2	4	5	43	1	0	0.003
5	3	1	2	5	5	43	1	0	0.005
5	3	1	2	6	3	21	22	0	0.182
5	3	1	2	7	3	21	15	0	0.111
5	3	1	3	1	3	21	15	0	0.156
5	3	1	3	2	3	21	18	0	0.211
5	3	1	3	3	1	0	14	0	0.201
5	3	1	3	4	3	21	7	0	0.070
5	3	2	1	1	3	21	7	0	0.080
5	3	2	1	2	2	8	34	0	0.179
5	3	2	1	3	3	21	12	0	0.062
5	3	2	1	4	1	0	28	0	0.260
5	3	2	1	5	3	21	17	0	0.086
5	3	2	1	6	3	21	24	0	0.172
5	3	2	1	7	4	29	5	0	0.032
5	3	2	1	8	1	0	21	0	0.129
5	3	2	1	9	3	21	14	0	0.104
5	3	2	1	10	3	21	20	0	0.121
5	3	2	1	11	3	21	9	0	0.014
5	3	2	1	12	1	0	19	0	0.055
5	3	2	2	1	3	21	11	0	0.161
5	3	2	2	3	3	21	20	0	0.133
5	3	2	2	4	1	0	15	0	0.175
5	3	2	2	5	3	21	9	0	0.054
5	3	2	2	6	3	21	11	0	0.108
5	3	2	2	7	3	21	11	0	0.081
5	3	2	2	8	1	0	17	0	0.130
5	3	2	2	9	1	0	21	0	0.183
5	3	2	2	10	3	21	4	0	0.021
5	3	2	3	1	3	21	11	0	0.073
5	3	2	3	2	3	21	9	0	0.069
5	3	2	3	3	3	21	15	0	0.117
5	3	2	3	4	3	21	24	0	0.169
5	3	2	3	5	3	21	19	0	0.162
5	3	2	3	6	1	0	46	0	0.542
5	3	2	3	7	2	8	18	0	0.091
5	3	2	3	8	3	21	9	0	0.087
5	3	2	3	9	1	0	42	0	0.325
5	3	2	3	10	2	8	37	0	0.358
5	4	1	1	1	3	21	30	0	0.459
5	4	1	1	2	3	21	20	0	0.165
5	4	1	1	3	3	21	22	0	0.212
5	4	1	1	4	3	21	17	0	0.178
5	4	1	1	5	3	21	11	0	0.089
5	4	1	1	6	3	21	8	0	0.081
5	4	1	1	7	3	21	23	0	0.192
5	4	1	1	8	3	21	19	0	0.205
5	4	1	1	9	3	21	10	0	0.087
5	4	1	2	1	3	21	20	0	0.159
5	4	1	2	2	3	21	13	0	0.086
5	4	1	3	1	4	29	10	0	0.054
5	4	1	3	2	3	21	16	0	0.179
5	4	1	3	3	4	29	4	0	0.013
5	4	1	3	4	4	29	9	0	0.039
5	4	1	3	5	3	21	11	0	0.099
5	4	1	3	6	4	29	3	0	0.009
5	4	1	3	7	4	29	5	0	0.033
5	4	1	3	8	3	21	26	0	0.152
5	4	1	3	9	3	21	11	0	0.076
5	4	1	3	10	5	43	3	0	0.020
5	4	1	3	11	3	21	22	0	0.334
5	4	1	3	12	4	29	2	0	0.008
5	4	1	3	13	4	29	7	0	0.037
5	4	1	3	14	3	21	21	0	0.200
5	4	1	3	15	4	29	6	0	0.041
5	4	1	3	16	1	0	48	0	0.352
5	4	1	3	17	3	21	13	0	0.083
5	4	1	3	18	3	21	12	0	0.093
5	4	1	3	19	3	21	9	0	0.056
5	4	1	3	20	3	21	21	0	0.128
5	4	2	1	1	2	8	71	0	0.868
5	4	2	1	2	3	21	59	0	0.294
5	4	2	1	3	3	21	37	0	0.704
5	4	2	1	4	3	21	15	0	0.046
5	4	2	1	5	2	8	21	0	0.129
5	4	2	1	6	3	21	48	0	0.341
5	4	2	1	7	1	0	60	0	1.422
5	4	2	1	8	3	21	37	0	0.326
5	4	2	1	9	4	29	10	0	0.080
5	4	2	1	10	1	0	53	0	0.760
5	4	2	1	11	4	29	23	0	0.078
5	4	2	1	12	1	0	65	0	0.460
5	4	2	1	13	3	21	43	0	0.477
5	4	2	2	1	3	21	27	0	0.169
5	4	2	2	2	3	21	18	0	0.148
5	4	2	2	3	3	21	24	0	0.216
5	4	2	2	4	5	43	6	0	0.020
5	4	2	2	5	3	21	18	0	0.081
5	4	2	2	6	4	29	10	0	0.026
5	4	2	2	7	3	21	15	0	0.078
5	4	2	2	8	4	29	3	0	0.011
5	4	2	2	9	3	21	14	0	0.054
5	4	2	2	10	1	0	14	0	0.065
5	4	2	3	1	1	0	67	0	1.218
5	4	2	3	2	1	0	40	0	0.555
5	4	2	3	3	5	43	4	0	0.040
5	4	2	3	4	3	21	26	0	0.136
5	4	2	3	5	3	21	21	0	0.167
5	4	2	3	6	3	21	24	0	0.139
5	4	2	3	7	3	21	32	0	0.197
5	4	2	3	8	5	43	9	0	0.031
5	4	2	3	9	5	43	4	0	0.010
5	4	2	3	10	4	29	9	0	0.034
5	5	1	1	1	3	21	10	0	0.091
5	5	1	1	2	5	43	4	0	0.019
5	5	1	1	3	3	21	9	0	0.035
5	5	1	1	4	1	0	11	0	0.072
5	5	1	1	5	3	21	9	0	0.054
5	5	1	1	6	3	21	12	0	0.120
5	5	1	1	7	3	21	7	0	0.037
5	5	1	1	8	3	21	9	0	0.041
5	5	1	1	9	3	21	7	0	0.028

A	B	C	D	E	F	G	H	I	J
5	5	1	1	10	1	0	3	0	0.014
5	5	1	1	11	1	0	10	0	0.055
5	5	1	1	12	3	21	3	0	0.006
5	5	1	1	13	3	21	8	0	0.072
5	5	1	1	14	2	8	7	0	0.067
5	5	1	1	15	3	21	5	0	0.017
5	5	1	1	16	1	0	11	0	0.067
5	5	1	1	17	3	21	6	0	0.046
5	5	1	1	18	3	21	4	0	0.025
5	5	1	1	19	4	29	2	0	0.006
5	5	1	1	20	3	21	8	0	0.032
5	5	1	2	1	3	21	8	0	0.043
5	5	1	2	2	4	29	3	0	0.019
5	5	1	2	3	1	0	13	0	0.059
5	5	1	2	4	4	29	9	0	0.031
5	5	1	2	5	3	21	10	0	0.051
5	5	1	2	6	3	21	6	0	0.028
5	5	1	2	7	1	0	9	0	0.044
5	5	1	2	8	3	21	8	0	0.076
5	5	1	2	9	3	21	8	0	0.031
5	5	1	2	10	3	21	6	0	0.029
5	5	1	2	11	3	21	8	0	0.031
5	5	1	2	12	3	21	9	0	0.067
5	5	1	2	13	3	21	10	0	0.120
5	5	1	3	1	3	21	10	0	0.029
5	5	1	3	2	4	29	6	0	0.029
5	5	1	3	3	3	21	10	0	0.019
5	5	1	3	5	3	21	6	0	0.017
5	5	1	3	6	3	21	7	0	0.039
5	5	1	3	7	4	29	4	0	0.015
5	5	1	3	8	3	21	8	0	0.033
5	5	1	3	10	4	29	2	0	0.007
5	5	1	3	11	4	29	3	0	0.012
5	5	1	3	12	3	21	15	0	0.205
5	5	2	1	1	3	21	16	0	0.117
5	5	2	1	2	2	8	15	0	0.152
5	5	2	1	3	3	21	12	0	0.054
5	5	2	1	4	2	8	23	0	0.189
5	5	2	1	5	3	21	16	0	0.086
5	5	2	1	6	3	21	26	0	0.129
5	5	2	1	7	1	0	67	0	0.408
5	5	2	1	8	3	21	13	0	0.077
5	5	2	1	9	2	8	21	0	0.116
5	5	2	1	10	3	21	9	0	0.034
5	5	2	1	11	3	21	19	0	0.090
5	5	2	1	12	3	21	14	0	0.075
5	5	2	1	13	2	8	20	0	0.088
5	5	2	1	14	1	0	11	0	0.068
5	5	2	1	15	3	21	11	0	0.022
5	5	2	1	16	3	21	12	0	0.042
5	5	2	1	17	3	21	11	0	0.041
5	5	2	1	18	3	21	11	0	0.027
5	5	2	1	19	3	21	20	0	0.047
5	5	2	1	20	3	21	3	0	0.009
5	5	2	2	1	2	8	13	0	0.118
5	5	2	2	2	1	0	25	0	0.236
5	5	2	2	3	1	0	18	0	0.157
5	5	2	2	4	1	0	47	0	0.591
5	5	2	2	5	3	21	19	0	0.080
5	5	2	2	6	2	8	22	0	0.170
5	5	2	2	7	2	8	29	0	0.237
5	5	2	2	8	3	21	15	0	0.183
5	5	2	2	9	2	8	11	0	0.153
5	5	2	2	10	3	21	1	0	0.006
5	5	2	2	11	2	8	12	0	0.126
5	5	2	2	12	1	0	13	0	0.096
5	5	2	2	13	4	29	4	0	0.021
5	5	2	3	1	3	21	11	0	0.081
5	5	2	3	2	1	0	9	0	0.027
5	5	2	3	3	1	0	11	0	0.061
5	5	2	3	4	3	21	8	0	0.034
5	5	2	3	5	1	0	13	0	0.088
5	5	2	3	6	1	0	23	0	0.329
5	5	2	3	7	1	0	19	0	0.215
5	5	2	3	8	4	29	5	0	0.023
5	5	2	3	9	3	21	5	0	0.051
5	5	2	3	10	3	21	10	0	0.079
5	5	2	3	11	2	8	11	0	0.059
5	5	2	3	12	1	0	22	0	0.296
5	5	2	3	13	2	8	7	0	0.055
5	5	2	3	14	1	0	16	0	0.096
5	5	2	3	15	3	21	19	0	0.110
5	5	2	3	16	4	29	1	0	0.008
5	5	2	3	17	3	21	10	0	0.040
5	5	2	3	18	3	21	14	0	0.164
5	5	2	3	19	1	0	16	0	0.079
5	5	2	3	20	1	0	22	0	0.225
6	1	1	1	1	1	0	26	0	0.430
6	1	1	1	2	2	8	16	0	0.164
6	1	1	1	3	1	0	22	0	0.258
6	1	1	1	4	3	21	8	0	0.076
6	1	1	1	5	1	0	22	0	0.282
6	1	1	1	6	1	0	19	0	0.194
6	1	1	1	7	1	0	10	0	0.111
6	1	1	1	8	1	0	16	0	0.206
6	1	1	1	9	3	21	6	0	0.044
6	1	1	1	10	1	0	36	0	0.651
6	1	1	1	11	1	0	8	0	0.089
6	1	1	1	12	3	21	4	0	0.027
6	1	1	1	13	3	21	7	0	0.060
6	1	1	1	14	3	21	12	0	0.076
6	1	1	1	15	1	0	19	0	0.279
6	1	1	1	16	3	21	4	0	0.026
6	1	1	1	17	1	0	20	0	0.202
6	1	1	1	18	1	0	16	0	0.187
6	1	1	1	19	1	0	24	0	0.345
6	1	1	1	20	3	21	4	0	0.038
6	1	1	2	1	3	21	9	0	0.049
6	1	1	2	2	3	21	11	0	0.081
6	1	1	2	3	2	8	19	0	0.224
6	1	1	2	4	3	21	7	0	0.060
6	1	1	2	5	2	8	10	0	0.117
6	1	1	2	6	3	21	10	0	0.065
6	1	1	2	7	3	21	23	0	0.293
6	1	1	2	8	3	21	24	0	0.206
6	1	1	2	9	3	21	10	0	0.091
6	1	1	2	10	3	21	7	0	0.056
6	1	1	2	11	2	8	15	0	0.140
6	1	1	2	12	3	21	8	0	0.061
6	1	1	2	13	1	0	24	0	0.263
6	1	1	2	14	3	21	12	0	0.136
6	1	1	2	15	1	0	25	0	0.234
6	1	1	2	16	3	21	9	0	0.061
6	1	1	2	17	3	21	10	0	0.072
6	1	1	2	18	3	21	15	0	0.143
6	1	1	2	19	3	21	20	0	0.224
6	1	1	2	20	1	0	17	0	0.278
6	1	1	3	1	1	0	31	0	0.298
6	1	1	3	2	3	21	7	0	0.062
6	1	1	3	3	1	0	7	0	0.089
6	1	1	3	4	1	0	13	0	0.140
6	1	1	3	5	1	0	14	0	0.143

A	B	C	D	E	F	G	H	I	J
6	1	1	3	6	1	0	19	0	0.233
6	1	1	3	7	1	0	8	0	0.103
6	1	1	3	8	1	0	24	0	0.320
6	1	1	3	9	1	0	9	0	0.086
6	1	1	3	10	3	21	4	0	0.028
6	1	1	3	11	1	0	17	0	0.145
6	1	1	3	12	3	21	6	0	0.040
6	1	1	3	13	3	21	16	0	0.127
6	1	1	3	14	3	21	7	0	0.031
6	1	1	3	15	3	21	3	0	0.012
6	1	1	3	16	3	21	5	0	0.035
6	1	1	3	17	1	0	21	0	0.178
6	1	1	3	18	1	0	11	0	0.105
6	1	1	3	19	3	21	11	0	0.071
6	1	1	3	20	1	0	21	0	0.281
6	1	2	1	1	1	0	19	0	0.239
6	1	2	1	2	1	0	21	0	0.196
6	1	2	1	3	1	0	9	0	0.038
6	1	2	1	4	1	0	20	0	0.147
6	1	2	1	5	2	8	11	0	0.072
6	1	2	1	6	1	0	17	0	0.111
6	1	2	1	7	1	0	35	0	0.265
6	1	2	1	8	3	21	5	0	0.066
6	1	2	1	9	1	0	26	0	0.297
6	1	2	1	10	2	8	9	0	0.063
6	1	2	1	11	2	8	20	0	0.174
6	1	2	1	12	2	8	11	0	0.150
6	1	2	1	13	1	0	35	0	0.313
6	1	2	1	14	3	21	24	0	0.203
6	1	2	1	15	3	21	10	0	0.080
6	1	2	1	16	2	8	9	0	0.080
6	1	2	1	17	1	0	30	0	0.341
6	1	2	1	18	1	0	22	0	0.302
6	1	2	1	19	3	21	6	0	0.031
6	1	2	1	20	1	0	10	0	0.062
6	1	2	2	1	2	8	22	0	0.181
6	1	2	2	2	2	8	27	0	0.242
6	1	2	2	3	1	0	35	0	0.395
6	1	2	2	4	1	0	21	0	0.186
6	1	2	2	5	2	8	14	0	0.132
6	1	2	2	6	2	8	19	0	0.115
6	1	2	2	7	1	0	12	0	0.107
6	1	2	2	8	3	21	22	0	0.156
6	1	2	2	9	1	0	38	0	0.514
6	1	2	2	10	1	0	26	0	0.226
6	1	2	2	11	3	21	18	0	0.138
6	1	2	2	12	1	0	55	0	0.746
6	1	2	2	13	1	0	30	0	0.254
6	1	2	2	14	1	0	21	0	0.285
6	1	2	2	15	1	0	35	0	0.433
6	1	2	2	16	1	0	54	0	0.973
6	1	2	2	17	2	8	14	0	0.075
6	1	2	2	18	2	8	14	0	0.148
6	1	2	2	19	1	0	33	0	0.389
6	1	2	2	20	2	8	24	0	0.130
6	1	2	3	1	1	0	21	0	0.237
6	1	2	3	2	1	0	18	0	0.172
6	1	2	3	3	1	0	22	0	0.330
6	1	2	3	4	1	0	29	0	0.274
6	1	2	3	5	1	0	22	0	0.181
6	1	2	3	6	3	21	13	0	0.105
6	1	2	3	7	1	0	25	0	0.163
6	1	2	3	8	3	21	4	0	0.035
6	1	2	3	9	3	21	27	0	0.235
6	1	2	3	10	1	0	37	0	0.505
6	1	2	3	11	2	8	28	0	0.244
6	1	2	3	12	1	0	19	0	0.136
6	1	2	3	13	1	0	21	0	0.146
6	1	2	3	14	1	0	46	0	0.404
6	1	2	3	15	1	0	19	0	0.137
6	1	2	3	16	1	0	23	0	0.136
6	1	2	3	17	2	8	13	0	0.127
6	1	2	3	18	2	8	21	0	0.138
6	1	2	3	19	1	0	15	0	0.110
6	1	2	3	20	1	0	31	0	0.262
6	2	1	1	1	3	21	12	0	0.100
6	2	1	1	2	1	0	20	0	0.185
6	2	1	1	3	1	0	15	0	0.147
6	2	1	1	4	1	0	17	0	0.159
6	2	1	1	5	1	0	10	0	0.087
6	2	1	1	6	1	0	19	0	0.195
6	2	1	1	7	3	21	26	0	0.212
6	2	1	1	8	3	21	13	0	0.089
6	2	1	1	9	1	0	5	0	0.030
6	2	1	1	10	2	8	7	0	0.050
6	2	1	1	11	2	8	3	0	0.026
6	2	1	1	12	3	21	4	0	0.029
6	2	1	1	13	1	0	16	0	0.105
6	2	1	1	14	3	21	4	0	0.020
6	2	1	1	15	3	21	2	0	0.007
6	2	1	1	16	3	21	7	0	0.032
6	2	1	2	1	3	21	9	0	0.090
6	2	1	2	2	3	21	14	0	0.142
6	2	1	2	3	3	21	21	0	0.209
6	2	1	2	4	3	21	8	0	0.035
6	2	1	2	5	1	0	14	0	0.186
6	2	1	2	6	1	0	16	0	0.158
6	2	1	2	7	3	21	7	0	0.055
6	2	1	2	8	3	21	7	0	0.043
6	2	1	2	9	1	0	14	0	0.179
6	2	1	2	10	1	0	8	0	0.070
6	2	1	2	11	3	21	12	0	0.098
6	2	1	2	12	3	21	12	0	0.095
6	2	1	2	13	3	21	9	0	0.042
6	2	1	2	14	3	21	9	0	0.057
6	2	1	2	15	3	21	13	0	0.103
6	2	1	2	16	1	0	22	0	0.226
6	2	1	2	17	3	21	11	0	0.057
6	2	1	2	18	3	21	9	0	0.040
6	2	1	2	19	1	0	10	0	0.060
6	2	1	2	20	2	8	2	0	0.017
6	2	1	3	1	1	0	25	0	0.257
6	2	1	3	2	1	0	13	0	0.167
6	2	1	3	3	3	21	7	0	0.052
6	2	1	3	4	3	21	1	0	0.010
6	2	1	3	5	1	0	12	0	0.132
6	2	1	3	6	1	0	21	0	0.181
6	2	1	3	7	2	8	28	0	0.416
6	2	1	3	8	3	21	7	0	0.045
6	2	1	3	9	3	21	3	0	0.018
6	2	1	3	10	1	0	23	0	0.238
6	2	1	3	11	3	21	20	0	0.133
6	2	1	3	12	2	8	10	0	0.082
6	2	1	3	13	1	0	12	0	0.146
6	2	1	3	14	1	0	15	0	0.143
6	2	1	3	15	1	0	36	0	0.497
6	2	1	3	16	2	8	2	0	0.012
6	2	1	3	17	3	21	3	0	0.016
6	2	1	3	18	1	0	19	0	0.176
6	2	1	3	19	2	8	10	0	0.103
6	2	1	3	20	1	0	11	0	0.119
6	2	2	1	1	3	21	7	0	0.060

A	B	C	D	E	F	G	H	I	J
6	2	2	1	2	1	0	6	0	0.041
6	2	2	1	3	1	0	4	0	0.017
6	2	2	1	4	1	0	14	0	0.123
6	2	2	1	5	1	0	13	0	0.114
6	2	2	1	6	1	0	6	0	0.037
6	2	2	1	7	1	0	11	0	0.087
6	2	2	1	8	1	0	8	0	0.070
6	2	2	1	9	1	0	12	0	0.100
6	2	2	1	10	1	0	17	0	0.145
6	2	2	1	11	1	0	14	0	0.141
6	2	2	1	12	2	8	3	0	0.017
6	2	2	1	13	1	0	13	0	0.134
6	2	2	1	14	3	21	8	0	0.043
6	2	2	1	15	1	0	2	0	0.014
6	2	2	1	16	1	0	11	0	0.118
6	2	2	1	17	1	0	12	0	0.149
6	2	2	1	18	3	21	8	0	0.059
6	2	2	1	19	1	0	10	0	0.078
6	2	2	1	20	1	0	13	0	0.116
6	2	2	2	1	2	8	22	0	0.203
6	2	2	2	2	3	21	13	0	0.083
6	2	2	2	3	2	8	14	0	0.134
6	2	2	2	4	3	21	20	0	0.186
6	2	2	2	5	1	0	49	0	0.649
6	2	2	2	6	1	0	17	0	0.156
6	2	2	2	7	1	0	32	0	0.319
6	2	2	2	8	1	0	25	0	0.276
6	2	2	2	9	3	21	5	0	0.031
6	2	2	2	10	1	0	18	0	0.139
6	2	2	2	11	1	0	19	0	0.189
6	2	2	2	12	2	8	22	0	0.273
6	2	2	2	13	2	8	29	0	0.345
6	2	2	2	14	2	8	26	0	0.167
6	2	2	2	15	2	8	29	0	0.391
6	2	2	2	16	3	21	4	0	0.036
6	2	2	2	17	2	8	22	0	0.166
6	2	2	2	18	3	21	16	0	0.124
6	2	2	2	19	1	0	21	0	0.131
6	2	2	2	20	2	8	24	0	0.168
6	2	2	3	1	1	0	28	0	0.340
6	2	2	3	2	1	0	54	0	0.748
6	2	2	3	3	1	0	45	0	0.408
6	2	2	3	4	1	0	40	0	0.354
6	2	2	3	5	1	0	27	0	0.315
6	2	2	3	6	1	0	38	0	0.327
6	2	2	3	7	2	8	29	0	0.237
6	2	2	3	8	1	0	54	0	1.040
6	2	2	3	9	1	0	38	0	0.456
6	2	2	3	10	3	21	22	0	0.188
6	2	2	3	11	1	0	18	0	0.189
6	2	2	3	12	1	0	10	0	0.104
6	2	2	3	13	3	21	24	0	0.156
6	2	2	3	14	1	0	31	0	0.536
6	2	2	3	15	1	0	40	0	0.502
6	2	2	3	16	3	21	31	0	0.158
6	2	2	3	17	1	0	42	0	0.470
6	2	2	3	18	1	0	47	0	0.372
6	2	2	3	19	1	0	34	0	0.420
6	2	2	3	20	1	0	35	0	0.537
6	3	1	1	1	3	21	7	0	0.079
6	3	1	1	2	3	21	14	0	0.171
6	3	1	1	3	1	0	39	0	0.529
6	3	1	1	4	1	0	37	0	0.809
6	3	1	1	5	1	0	28	0	0.409
6	3	1	1	6	1	0	30	0	0.599
6	3	1	1	7	3	21	27	0	0.377

A	B	C	D	E	F	G	H	I	J
6	3	1	1	8	2	8	8	0	0.055
6	3	1	1	9	3	21	10	0	0.059
6	3	1	1	10	1	0	64	0	1.010
6	3	1	1	11	3	21	23	0	0.349
6	3	1	1	12	1	0	21	0	0.245
6	3	1	1	13	3	21	19	0	0.190
6	3	1	1	14	2	8	34	0	0.454
6	3	1	1	15	1	0	45	0	0.723
6	3	1	1	16	4	29	27	0	0.355
6	3	1	1	17	4	29	6	0	0.043
6	3	1	1	18	4	29	12	0	0.141
6	3	1	2	1	3	21	11	0	0.083
6	3	1	2	2	3	21	22	0	0.196
6	3	1	2	3	1	0	21	0	0.350
6	3	1	2	4	3	21	19	0	0.251
6	3	1	2	5	3	21	10	0	0.099
6	3	1	2	6	3	21	3	0	0.011
6	3	1	2	7	3	21	24	0	0.226
6	3	1	2	8	3	21	12	0	0.076
6	3	1	2	9	3	21	3	0	0.015
6	3	1	2	10	3	21	2	0	0.007
6	3	1	2	11	4	29	15	0	0.124
6	3	1	2	12	4	29	10	0	0.052
6	3	1	2	13	4	29	3	0	0.014
6	3	1	2	14	4	29	1	0	0.007
6	3	1	2	15	5	43	4	0	0.011
6	3	1	2	16	5	43	3	0	0.010
6	3	1	2	17	5	43	1	0	0.003
6	3	1	3	1	3	21	11	0	0.089
6	3	1	3	2	3	21	9	0	0.078
6	3	1	3	3	3	21	11	0	0.092
6	3	1	3	4	1	0	30	0	0.465
6	3	1	3	5	3	21	7	0	0.024
6	3	1	3	6	3	21	6	0	0.040
6	3	1	3	7	3	21	8	0	0.048
6	3	1	3	8	3	21	9	0	0.067
6	3	1	3	9	3	21	6	0	0.033
6	3	1	3	10	3	21	11	0	0.078
6	3	1	3	11	3	21	10	0	0.071
6	3	1	3	12	3	21	3	0	0.015
6	3	1	3	13	3	21	11	0	0.110
6	3	1	3	14	3	21	11	0	0.075
6	3	1	3	15	3	21	16	0	0.163
6	3	1	3	16	4	29	2	0	0.006
6	3	1	3	17	4	29	5	0	0.027
6	3	1	3	18	4	29	4	0	0.026
6	3	1	3	19	4	29	1	0	0.004
6	3	1	3	20	4	29	3	0	0.019
6	3	2	1	1	1	0	26	0	0.305
6	3	2	1	2	2	8	13	0	0.140
6	3	2	1	3	1	0	32	0	0.341
6	3	2	1	4	1	0	30	0	0.247
6	3	2	1	5	1	0	32	0	0.462
6	3	2	1	6	2	8	20	0	0.150
6	3	2	1	7	1	0	28	0	0.211
6	3	2	1	8	2	8	12	0	0.088
6	3	2	1	9	1	0	7	0	0.059
6	3	2	1	10	1	0	28	0	0.268
6	3	2	1	11	1	0	48	0	0.428
6	3	2	1	12	2	8	30	0	0.245
6	3	2	1	13	1	0	22	0	0.206
6	3	2	1	14	1	0	25	0	0.224
6	3	2	1	15	1	0	41	0	0.516
6	3	2	1	16	2	8	27	0	0.199
6	3	2	1	17	2	8	8	0	0.050
6	3	2	1	18	1	0	21	0	0.178

A	B	C	D	E	F	G	H	I	J
6	3	2	1	19	1	0	35	0	0.404
6	3	2	1	20	1	0	11	0	0.168
6	3	2	2	1	2	8	31	0	0.444
6	3	2	2	2	1	0	27	0	0.371
6	3	2	2	3	1	0	31	0	0.608
6	3	2	2	4	1	0	17	0	0.183
6	3	2	2	5	2	8	17	0	0.176
6	3	2	2	6	1	0	24	0	0.334
6	3	2	2	7	1	0	28	0	0.484
6	3	2	2	8	1	0	22	0	0.263
6	3	2	2	9	1	0	36	0	0.620
6	3	2	2	10	1	0	26	0	0.463
6	3	2	2	11	1	0	24	0	0.484
6	3	2	2	12	1	0	23	0	0.292
6	3	2	2	13	1	0	7	0	0.108
6	3	2	2	14	1	0	46	0	0.574
6	3	2	2	15	1	0	33	0	0.615
6	3	2	2	16	1	0	29	0	0.427
6	3	2	2	17	2	8	23	0	0.349
6	3	2	2	18	1	0	41	0	0.749
6	3	2	2	19	1	0	33	0	0.833
6	3	2	2	20	1	0	29	0	0.400
6	3	2	3	1	3	21	17	0	0.135
6	3	2	3	2	3	21	26	0	0.510
6	3	2	3	3	3	21	21	0	0.214
6	3	2	3	4	3	21	15	0	0.170
6	3	2	3	5	3	21	10	0	0.086
6	3	2	3	6	2	8	34	0	0.555
6	3	2	3	7	2	8	21	0	0.221
6	3	2	3	8	1	0	39	0	0.598
6	3	2	3	9	2	8	33	0	0.328
6	3	2	3	10	3	21	23	0	0.233
6	3	2	3	11	1	0	35	0	0.432
6	3	2	3	12	3	21	18	0	0.159
6	3	2	3	13	3	21	25	0	0.427
6	3	2	3	14	3	21	26	0	0.343
6	3	2	3	15	3	21	21	0	0.219
6	3	2	3	16	3	21	18	0	0.276
6	3	2	3	17	2	8	23	0	0.208
6	3	2	3	18	1	0	50	0	0.507
6	3	2	3	19	2	8	25	0	0.295
6	3	2	3	20	3	21	16	0	0.223
6	4	1	1	1	3	21	19	0	0.133
6	4	1	1	2	3	21	8	0	0.078
6	4	1	1	3	3	21	11	0	0.101
6	4	1	1	4	3	21	11	0	0.066
6	4	1	1	5	1	0	20	0	0.197
6	4	1	1	6	1	0	33	0	0.328
6	4	1	1	7	1	0	15	0	0.121
6	4	1	1	8	1	0	13	0	0.183
6	4	1	1	9	1	0	35	0	0.432
6	4	1	1	10	3	21	7	0	0.062
6	4	1	1	11	3	21	4	0	0.027
6	4	1	1	12	3	21	12	0	0.111
6	4	1	1	13	3	21	7	0	0.072
6	4	1	1	14	3	21	6	0	0.032
6	4	1	1	15	3	21	6	0	0.076
6	4	1	1	16	3	21	3	0	0.024
6	4	1	1	17	3	21	4	0	0.049
6	4	1	1	18	3	21	8	0	0.055
6	4	1	1	19	3	21	7	0	0.065
6	4	1	1	20	2	8	18	0	0.140
6	4	1	2	1	2	8	33	0	0.629
6	4	1	2	2	1	0	25	0	0.446
6	4	1	2	3	3	21	13	0	0.108
6	4	1	2	4	1	0	20	0	0.271
6	4	1	2	5	1	0	20	0	0.217
6	4	1	2	6	3	21	10	0	0.087
6	4	1	2	7	1	0	20	0	0.237
6	4	1	2	8	3	21	9	0	0.101
6	4	1	2	9	3	21	12	0	0.123
6	4	1	2	10	1	0	19	0	0.303
6	4	1	2	11	1	0	32	0	0.523
6	4	1	2	12	2	8	9	0	0.123
6	4	1	2	13	1	0	26	0	0.377
6	4	1	2	14	1	0	21	0	0.535
6	4	1	2	15	1	0	7	0	0.066
6	4	1	2	16	1	0	14	0	0.178
6	4	1	2	17	3	21	10	0	0.156
6	4	1	2	18	2	8	10	0	0.092
6	4	1	2	19	3	21	3	0	0.018
6	4	1	2	20	3	21	6	0	0.042
6	4	1	3	1	1	0	39	0	0.713
6	4	1	3	2	1	0	36	0	0.406
6	4	1	3	3	1	0	40	0	0.769
6	4	1	3	4	3	21	21	0	0.174
6	4	1	3	5	3	21	8	0	0.070
6	4	1	3	6	1	0	45	0	0.904
6	4	1	3	7	1	0	48	0	0.728
6	4	1	3	8	3	21	23	0	0.335
6	4	1	3	9	1	0	29	0	0.491
6	4	1	3	10	1	0	31	0	0.410
6	4	1	3	11	2	8	21	0	0.381
6	4	1	3	12	1	0	38	0	0.736
6	4	1	3	13	3	21	13	0	0.175
6	4	1	3	14	3	21	7	0	0.110
6	4	1	3	15	3	21	13	0	0.099
6	4	1	3	16	1	0	55	0	1.326
6	4	1	3	17	1	0	33	0	0.414
6	4	1	3	18	1	0	18	0	0.269
6	4	1	3	19	1	0	52	0	1.295
6	4	1	3	20	1	0	47	0	0.758
6	4	2	1	1	1	0	43	0	1.238
6	4	2	1	2	1	0	42	0	1.019
6	4	2	1	3	3	21	28	0	0.391
6	4	2	1	4	3	21	40	0	0.554
6	4	2	1	5	3	21	26	0	0.431
6	4	2	1	6	1	0	46	0	0.602
6	4	2	1	7	2	8	27	0	0.292
6	4	2	1	8	2	8	34	0	0.404
6	4	2	1	9	1	0	45	0	0.736
6	4	2	1	10	2	8	35	0	0.730
6	4	2	1	11	1	0	38	0	0.713
6	4	2	1	12	1	0	21	0	0.250
6	4	2	1	13	1	0	50	0	1.152
6	4	2	1	14	3	21	26	0	0.436
6	4	2	1	15	1	0	59	0	1.173
6	4	2	1	16	1	0	33	0	0.507
6	4	2	1	17	3	21	40	0	0.689
6	4	2	1	18	2	8	31	0	0.648
6	4	2	1	19	1	0	31	0	0.365
6	4	2	1	20	2	8	48	0	0.685
6	4	2	2	1	1	0	62	0	1.595
6	4	2	2	2	1	0	48	0	0.782
6	4	2	2	3	3	21	22	0	0.323
6	4	2	2	4	2	8	38	0	0.701
6	4	2	2	5	1	0	28	0	0.406
6	4	2	2	6	3	21	26	0	0.194
6	4	2	2	7	2	8	18	0	0.163
6	4	2	2	8	3	21	31	0	0.474
6	4	2	2	9	1	0	42	0	0.703
6	4	2	2	10	3	21	33	0	0.239

A	B	C	D	E	F	G	H	I	J
6	4	2	2	11	1	0	76	0	1.152
6	4	2	2	12	3	21	45	0	0.519
6	4	2	2	13	1	0	65	0	1.124
6	4	2	2	14	1	0	68	0	1.469
6	4	2	2	15	3	21	26	0	0.295
6	4	2	2	16	2	8	59	0	0.911
6	4	2	2	17	2	8	36	0	0.600
6	4	2	2	18	3	21	22	0	0.275
6	4	2	2	19	2	8	56	0	0.949
6	4	2	2	20	3	21	46	0	0.479
6	4	2	3	1	3	21	13	0	0.076
6	4	2	3	2	3	21	14	0	0.073
6	4	2	3	3	1	0	44	0	0.486
6	4	2	3	4	2	8	30	0	0.216
6	4	2	3	5	2	8	34	0	0.415
6	4	2	3	6	3	21	26	0	0.285
6	4	2	3	7	1	0	37	0	0.650
6	4	2	3	8	3	21	63	0	0.748
6	4	2	3	9	2	8	27	0	0.256
6	4	2	3	10	2	8	17	0	0.185
6	4	2	3	11	3	21	22	0	0.197
6	4	2	3	12	3	21	11	0	0.060
6	4	2	3	13	3	21	24	0	0.203
6	4	2	3	14	2	8	19	0	0.138
6	4	2	3	15	3	21	15	0	0.105
6	4	2	3	16	1	0	41	0	0.327
6	4	2	3	17	3	21	15	0	0.133
6	4	2	3	18	2	8	15	0	0.144
6	4	2	3	19	1	0	19	0	0.206
6	4	2	3	20	3	21	31	0	0.200
6	5	1	1	1	3	21	13	0	0.106
6	5	1	1	2	1	0	7	0	0.076
6	5	1	1	3	3	21	5	0	0.034
6	5	1	1	4	1	0	10	0	0.131
6	5	1	1	5	3	21	11	0	0.087
6	5	1	1	6	2	8	6	0	0.040
6	5	1	1	7	1	0	15	0	0.137
6	5	1	1	8	3	21	9	0	0.070
6	5	1	1	9	2	8	22	0	0.201
6	5	1	1	10	3	21	5	0	0.044
6	5	1	1	11	2	8	9	0	0.072
6	5	1	1	12	4	29	1	0	0.005
6	5	1	1	13	4	29	3	0	0.024
6	5	1	1	14	3	21	11	0	0.079
6	5	1	1	15	3	21	10	0	0.076
6	5	1	1	16	3	21	5	0	0.034
6	5	1	1	17	3	21	1	0	0.003
6	5	1	1	18	4	29	2	0	0.010
6	5	1	1	19	3	21	14	0	0.092
6	5	1	1	20	3	21	13	0	0.114
6	5	1	2	1	3	21	4	0	0.015
6	5	1	2	2	3	21	7	0	0.054
6	5	1	2	3	4	29	1	0	0.003
6	5	1	2	4	3	21	7	0	0.040
6	5	1	2	5	3	21	6	0	0.053
6	5	1	2	6	2	8	3	0	0.030
6	5	1	2	7	2	8	7	0	0.060
6	5	1	2	8	3	21	3	0	0.021
6	5	1	2	9	4	29	1	0	0.005
6	5	1	2	10	3	21	13	0	0.085
6	5	1	2	11	3	21	2	0	0.018
6	5	1	2	12	3	21	4	0	0.034
6	5	1	2	13	3	21	9	0	0.073
6	5	1	2	14	2	8	7	0	0.047
6	5	1	2	15	3	21	7	0	0.065
6	5	1	2	16	3	21	8	0	0.077
6	5	1	2	17	3	21	5	0	0.032
6	5	1	2	18	3	21	5	0	0.052
6	5	1	2	19	4	29	4	0	0.023
6	5	1	2	20	5	43	1	0	0.005
6	5	1	3	1	3	21	7	0	0.061
6	5	1	3	2	1	0	14	0	0.112
6	5	1	3	3	3	21	7	0	0.044
6	5	1	3	4	2	8	6	0	0.045
6	5	1	3	5	3	21	9	0	0.101
6	5	1	3	6	3	21	8	0	0.068
6	5	1	3	7	1	0	15	0	0.152
6	5	1	3	8	3	21	9	0	0.078
6	5	1	3	9	3	21	3	0	0.018
6	5	1	3	10	3	21	10	0	0.081
6	5	1	3	11	3	21	10	0	0.082
6	5	1	3	12	3	21	6	0	0.034
6	5	1	3	13	3	21	8	0	0.058
6	5	1	3	14	3	21	9	0	0.069
6	5	1	3	15	3	21	3	0	0.016
6	5	1	3	16	3	21	4	0	0.014
6	5	1	3	17	4	29	3	0	0.012
6	5	1	3	18	5	43	2	0	0.001
6	5	1	3	19	5	43	1	0	0.001
6	5	1	3	20	4	29	1	0	0.003
6	5	2	1	1	2	8	18	0	0.211
6	5	2	1	2	2	8	33	0	0.298
6	5	2	1	3	1	0	36	0	0.423
6	5	2	1	4	2	8	25	0	0.234
6	5	2	1	5	2	8	25	0	0.173
6	5	2	1	6	3	21	16	0	0.128
6	5	2	1	7	2	8	5	0	0.049
6	5	2	1	8	2	8	37	0	0.438
6	5	2	1	9	3	21	22	0	0.221
6	5	2	1	10	1	0	30	0	0.235
6	5	2	1	11	1	0	62	0	0.790
6	5	2	1	12	3	21	32	0	0.201
6	5	2	1	13	1	0	35	0	0.521
6	5	2	1	14	3	21	28	0	0.168
6	5	2	1	15	3	21	37	0	0.182
6	5	2	1	16	3	21	15	0	0.130
6	5	2	1	17	1	0	44	0	0.452
6	5	2	1	18	1	0	45	0	0.519
6	5	2	1	19	2	8	35	0	0.428
6	5	2	1	20	2	8	40	0	0.342
6	5	2	2	1	1	0	39	0	0.533
6	5	2	2	2	1	0	14	0	0.138
6	5	2	2	3	1	0	31	0	0.525
6	5	2	2	4	1	0	15	0	0.167
6	5	2	2	5	1	0	13	0	0.165
6	5	2	2	6	1	0	12	0	0.126
6	5	2	2	7	1	0	20	0	0.161
6	5	2	2	8	1	0	19	0	0.211
6	5	2	2	9	1	0	10	0	0.099
6	5	2	2	10	2	8	14	0	0.124
6	5	2	2	11	2	8	18	0	0.185
6	5	2	2	12	1	0	13	0	0.115
6	5	2	2	13	1	0	42	0	0.566
6	5	2	2	14	1	0	16	0	0.143
6	5	2	2	15	1	0	11	0	0.182
6	5	2	2	16	2	8	24	0	0.299
6	5	2	2	17	1	0	43	0	0.559
6	5	2	2	18	1	0	16	0	0.239
6	5	2	2	19	1	0	31	0	0.427
6	5	2	2	20	1	0	14	0	0.176
6	5	2	3	1	1	0	25	0	0.326
6	5	2	3	2	1	0	30	0	0.412

A	B	C	D	E	F	G	H	I	J
6	5	2	3	3	2	8	26	0	0.274
6	5	2	3	4	2	8	27	0	0.345
6	5	2	3	5	3	21	15	0	0.135
6	5	2	3	6	2	8	31	0	0.486
6	5	2	3	7	2	8	19	0	0.168
6	5	2	3	8	2	8	14	0	0.129
6	5	2	3	9	2	8	25	0	0.251
6	5	2	3	10	3	21	9	0	0.065
6	5	2	3	11	3	21	13	0	0.089
6	5	2	3	12	2	8	13	0	0.154
6	5	2	3	13	2	8	26	0	0.206
6	5	2	3	14	2	8	30	0	0.345
6	5	2	3	15	2	8	15	0	0.186
6	5	2	3	16	1	0	28	0	0.368
6	5	2	3	17	2	8	32	0	0.329
6	5	2	3	18	3	21	16	0	0.144
6	5	2	3	19	3	21	7	0	0.053
6	5	2	3	20	2	8	21	0	0.246
7	1	1	1	1	3	21	7	0	0.205
7	1	1	1	2	1	0	9	0	0.514
7	1	1	2	1	3	21	21	0	0.578
7	1	1	3	1	1	0	10	0	0.354
7	1	1	3	2	3	21	2	0	0.025
7	1	1	3	3	1	0	10	0	0.382
7	1	1	3	4	3	21	9	0	0.169
7	1	1	3	5	2	8	8	0	0.189
7	1	2	1	1	1	0	38	1	2.430
7	1	2	1	2	3	21	12	0	0.441
7	1	2	1	3	1	0	18	0	0.708
7	1	2	2	1	3	21	4	0	0.088
7	1	2	2	2	5	43	3	0	0.034
7	1	2	3	1	1	0	9	0	0.289
7	1	2	3	2	1	0	7	0	0.195
7	2	1	1	1	3	21	13	0	0.453
7	2	1	1	2	2	8	20	0	0.813
7	2	1	1	3	3	21	10	0	0.332
7	2	1	2	1	3	21	15	0	0.578
7	2	1	2	2	3	21	9	0	0.228
7	2	1	2	3	3	21	7	0	0.195
7	2	1	3	1	2	8	3	0	0.063
7	2	1	3	2	1	0	7	0	0.179
7	2	2	1	1	3	21	7	0	0.218
7	2	2	1	2	3	21	3	0	0.063
7	2	2	1	3	3	21	6	0	0.183
7	2	2	2	1	4	29	8	0	0.207
7	2	2	2	2	3	21	17	0	0.690
7	2	2	2	3	3	21	14	0	0.460
7	2	2	2	4	2	8	4	0	0.016
7	2	2	2	5	3	21	11	0	0.352
7	2	2	2	6	3	21	13	0	0.541
7	2	2	2	7	3	21	14	0	0.466
7	2	2	2	8	1	0	26	0	1.363
7	2	2	2	9	3	21	9	0	0.243
7	2	2	3	1	3	21	5	0	0.046
7	2	2	3	2	1	0	15	0	0.639
7	3	1	1	1	1	0	22	0	1.543
7	3	1	1	2	1	0	20	0	1.102
7	3	1	2	1	1	0	25	0	0.870
7	3	2	1	1	2	8	24	0	1.508
7	3	2	1	2	1	0	22	0	1.539
7	3	2	1	3	1	0	23	0	1.401
7	3	2	2	1	1	0	41	0	2.953
7	3	2	2	2	3	21	17	0	0.592
7	4	1	1	1	3	21	7	0	0.294
7	4	1	2	1	3	21	9	0	0.201
7	4	1	2	2	2	8	9	0	0.401
7	4	1	3	1	2	8	8	0	0.316
7	4	1	3	2	4	29	2	0	0.025
7	4	2	1	1	4	29	7	0	0.166
7	4	2	2	1	2	8	17	0	0.561
7	4	2	3	1	1	0	33	0	1.860
7	4	2	3	2	5	43	3	0	0.017
7	5	1	1	1	3	21	4	0	0.041
7	5	1	2	1	3	21	6	0	0.101
7	5	1	3	1	4	29	3	0	0.062
7	5	2	1	1	1	0	22	0	1.067
7	5	2	2	1	3	21	9	0	0.271
7	5	2	2	2	1	0	15	0	0.422
7	5	2	2	3	2	8	11	0	0.361
7	5	2	2	4	1	0	19	0	0.848
7	5	2	2	5	1	0	10	0	0.236
7	5	2	2	6	1	0	13	0	0.594
7	5	2	3	1	1	0	10	0	0.314
8	1	1	1	1	1	0	22	0	1.556
8	1	1	1	2	1	0	22	0	1.440
8	1	1	1	3	1	0	4	0	0.103
8	1	1	1	4	1	0	23	0	1.705
8	1	1	1	5	1	0	22	0	1.573
8	1	1	1	6	2	8	9	0	0.292
8	1	1	1	7	2	8	3	0	0.093
8	1	1	1	8	1	0	13	0	0.327
8	1	1	1	9	5	43	1	0	0.018
8	1	1	1	10	1	0	11	0	0.739
8	1	1	1	11	1	0	3	0	0.106
8	1	1	2	1	1	0	16	0	0.814
8	1	1	2	2	3	21	4	0	0.122
8	1	1	2	3	1	0	15	0	1.029
8	1	1	2	4	3	21	10	0	0.492
8	1	1	2	5	3	21	3	0	0.072
8	1	1	2	6	3	21	5	0	0.127
8	1	1	2	7	1	0	19	0	1.286
8	1	1	2	8	3	21	3	0	0.050
8	1	1	2	9	2	8	17	0	0.897
8	1	1	3	1	1	0	5	0	0.214
8	1	1	3	2	3	21	1	0	0.007
8	1	1	3	3	1	0	10	0	0.445
8	1	1	3	4	1	0	3	0	0.054
8	1	1	3	5	1	0	3	0	0.067
8	1	1	3	6	3	21	3	0	0.050
8	1	1	3	7	2	8	3	0	0.065
8	1	1	3	8	2	8	2	0	0.041
8	1	1	3	9	1	0	3	0	0.104
8	1	2	1	1	1	0	20	0	1.461
8	1	2	1	2	1	0	19	0	1.101
8	1	2	1	3	1	0	13	0	0.605
8	1	2	1	4	1	0	8	0	0.368
8	1	2	1	5	1	0	17	0	0.611
8	1	2	1	6	1	0	20	0	1.055
8	1	2	1	7	3	21	7	0	0.411
8	1	2	1	8	1	0	22	0	0.541
8	1	2	1	9	1	0	28	0	2.557
8	1	2	1	10	1	0	9	0	0.357
8	1	2	1	11	1	0	14	0	0.740
8	1	2	1	12	1	0	3	0	0.057
8	1	2	1	13	1	0	19	0	1.227
8	1	2	2	1	1	0	25	1	2.105
8	1	2	2	2	1	0	10	0	0.500
8	1	2	2	3	1	0	22	0	1.664
8	1	2	2	4	1	0	10	0	0.514
8	1	2	2	5	1	0	19	0	1.295
8	1	2	2	6	1	0	12	0	0.720
8	1	2	2	7	1	0	13	0	0.974

A	B	C	D	E	F	G	H	I	J
8	1	2	2	8	1	0	6	0	0.287
8	1	2	2	9	1	0	18	0	1.017
8	1	2	2	10	1	0	9	0	0.519
8	1	2	2	11	1	0	14	0	0.889
8	1	2	2	12	1	0	11	0	0.618
8	1	2	2	13	1	0	7	0	0.284
8	1	2	2	14	1	0	15	0	1.229
8	1	2	3	1	1	0	3	0	0.113
8	1	2	3	2	1	0	6	0	0.333
8	1	2	3	3	1	0	12	0	0.574
8	1	2	3	4	1	0	8	0	0.229
8	1	2	3	5	1	0	6	0	0.066
8	1	2	3	6	1	0	11	0	0.636
8	1	2	3	7	1	0	3	0	0.241
8	1	2	3	8	1	0	7	0	0.149
8	1	2	3	9	1	0	10	0	0.424
8	1	2	3	10	1	0	6	0	0.172
8	1	2	3	11	1	0	6	0	0.241
8	2	1	1	1	2	8	12	0	0.647
8	2	1	1	2	1	0	7	0	0.499
8	2	1	1	3	3	21	4	0	0.104
8	2	1	1	4	1	0	7	0	0.331
8	2	1	1	5	1	0	12	0	0.822
8	2	1	1	6	2	8	4	0	0.208
8	2	1	1	7	1	0	19	0	1.527
8	2	1	1	8	3	21	2	0	0.027
8	2	1	1	9	1	0	7	0	0.358
8	2	1	1	10	1	0	4	0	0.157
8	2	1	1	11	1	0	11	0	0.634
8	2	1	1	12	1	0	4	0	0.202
8	2	1	1	13	1	0	9	0	0.618
8	2	1	1	14	1	0	7	0	0.373
8	2	1	1	15	1	0	6	0	0.248
8	2	1	1	16	1	0	6	0	0.293
8	2	1	1	17	1	0	4	0	0.183
8	2	1	1	18	3	21	3	0	0.082
8	2	1	1	19	1	0	3	0	0.065
8	2	1	2	1	1	0	3	0	0.102
8	2	1	2	2	1	0	4	0	0.153
8	2	1	2	3	3	21	2	0	0.060
8	2	1	2	4	2	8	2	0	0.032
8	2	1	2	5	1	0	7	0	0.421
8	2	1	2	6	3	21	3	0	0.080
8	2	1	2	7	1	0	4	0	0.198
8	2	1	2	8	1	0	4	0	0.112
8	2	1	2	9	1	0	1	0	0.032
8	2	1	2	10	1	0	12	0	0.826
8	2	1	2	11	1	0	5	0	0.287
8	2	1	2	12	1	0	4	0	0.148
8	2	1	2	13	1	0	4	0	0.109
8	2	1	2	14	3	21	2	0	0.027
8	2	1	2	15	1	0	2	0	0.086
8	2	1	2	16	1	0	2	0	0.060
8	2	1	2	17	1	0	6	0	0.291
8	2	1	2	18	1	0	3	0	0.155
8	2	1	2	19	1	0	5	0	0.127
8	2	1	2	20	3	21	1	0	0.038
8	2	1	3	1	1	0	11	0	0.674
8	2	1	3	2	1	0	7	0	0.306
8	2	1	3	3	1	0	11	0	0.685
8	2	1	3	4	1	0	9	0	0.541
8	2	1	3	5	1	0	7	0	0.339
8	2	1	3	6	1	0	11	0	0.686
8	2	1	3	7	2	8	2	0	0.056
8	2	1	3	8	4	29	3	0	0.077
8	2	1	3	9	2	8	3	0	0.136
8	2	1	3	10	1	0	4	0	0.190
8	2	1	3	11	1	0	4	0	0.147
8	2	1	3	12	2	8	3	0	0.096
8	2	1	3	13	1	0	8	0	0.317
8	2	1	3	14	1	0	7	0	0.355
8	2	1	3	15	1	0	9	0	0.551
8	2	1	3	16	1	0	10	0	0.623
8	2	1	3	17	1	0	4	0	0.195
8	2	2	1	1	1	0	4	0	0.105
8	2	2	1	2	1	0	2	0	0.039
8	2	2	1	3	1	0	9	0	0.514
8	2	2	1	4	1	0	4	0	0.105
8	2	2	1	5	1	0	14	0	0.917
8	2	2	1	6	1	0	19	0	1.016
8	2	2	1	7	1	0	5	0	0.245
8	2	2	1	8	1	0	4	0	0.262
8	2	2	1	9	1	0	7	0	0.278
8	2	2	1	10	1	0	14	0	0.961
8	2	2	1	11	1	0	13	0	0.690
8	2	2	1	12	3	21	5	0	0.084
8	2	2	1	13	1	0	19	0	1.336
8	2	2	1	14	1	0	5	0	0.169
8	2	2	1	15	1	0	8	0	0.318
8	2	2	1	16	1	0	5	0	0.131
8	2	2	1	17	1	0	3	0	0.034
8	2	2	1	18	1	0	7	0	0.423
8	2	2	1	19	1	0	17	0	1.361
8	2	2	1	20	1	0	7	0	0.206
8	2	2	2	1	1	0	11	0	0.781
8	2	2	2	2	1	0	13	0	0.748
8	2	2	2	3	1	0	15	0	0.959
8	2	2	2	4	1	0	9	0	0.456
8	2	2	2	5	1	0	7	0	0.231
8	2	2	2	6	1	0	3	0	0.071
8	2	2	2	7	1	0	8	0	0.615
8	2	2	2	8	1	0	9	0	0.765
8	2	2	2	9	1	0	6	0	0.192
8	2	2	2	10	1	0	11	0	0.542
8	2	2	2	11	1	0	4	0	0.106
8	2	2	2	12	3	21	3	0	0.071
8	2	2	2	13	1	0	3	0	0.071
8	2	2	2	14	1	0	6	0	0.176
8	2	2	2	15	1	0	7	0	0.333
8	2	2	2	16	1	0	11	0	0.589
8	2	2	2	17	1	0	5	0	0.370
8	2	2	2	18	1	0	8	0	0.377
8	2	2	2	19	1	0	7	0	0.326
8	2	2	2	20	1	0	7	0	0.174
8	2	2	3	1	1	0	6	0	0.184
8	2	2	3	2	1	0	3	0	0.085
8	2	2	3	3	1	0	10	0	0.554
8	2	2	3	4	1	0	6	0	0.239
8	2	2	3	5	1	0	7	0	0.320
8	2	2	3	6	1	0	11	0	0.786
8	2	2	3	7	1	0	12	0	0.737
8	2	2	3	8	1	0	12	0	0.760
8	2	2	3	9	1	0	10	0	0.520
8	2	2	3	10	1	0	10	0	0.413
8	2	2	3	11	1	0	7	0	0.259
8	2	2	3	12	1	0	11	0	0.618
8	2	2	3	13	1	0	12	0	0.632
8	2	2	3	14	1	0	3	0	0.050
8	2	2	3	15	1	0	8	0	0.271
8	2	2	3	16	1	0	5	0	0.215
8	2	2	3	17	1	0	6	0	0.163
8	2	2	3	18	1	0	10	0	0.518

A	B	C	D	E	F	G	H	I	J
8	2	2	3	19	1	0	3	0	0.049
8	3	1	1	1	1	0	23	0	1.548
8	3	1	1	2	1	0	25	1	2.365
8	3	1	1	3	1	0	17	0	1.027
8	3	1	1	4	1	0	17	0	1.205
8	3	1	1	5	1	0	11	0	0.568
8	3	1	1	6	1	0	19	0	1.240
8	3	1	1	7	1	0	25	0	1.654
8	3	1	1	8	1	0	15	0	0.837
8	3	1	1	9	1	0	9	0	0.492
8	3	1	1	10	1	0	6	0	0.329
8	3	1	1	11	1	0	13	0	0.694
8	3	1	1	12	1	0	10	0	0.798
8	3	1	1	13	1	0	7	0	0.269
8	3	1	1	14	1	0	4	0	0.169
8	3	1	1	15	1	0	15	0	0.912
8	3	1	1	16	1	0	13	0	0.699
8	3	1	1	17	1	0	15	0	0.755
8	3	1	1	18	1	0	12	0	0.506
8	3	1	2	1	3	21	4	0	0.099
8	3	1	2	2	1	0	7	0	0.282
8	3	1	2	3	1	0	11	0	0.748
8	3	1	2	4	1	0	16	0	0.854
8	3	1	2	5	3	21	1	0	0.008
8	3	1	2	6	1	0	12	0	0.629
8	3	1	2	7	1	0	5	0	0.158
8	3	1	2	8	1	0	15	0	0.946
8	3	1	3	1	2	8	6	0	0.268
8	3	1	3	2	1	0	6	0	0.230
8	3	1	3	3	1	0	7	0	0.278
8	3	1	3	4	1	0	12	0	0.718
8	3	1	3	5	1	0	1	0	0.021
8	3	1	3	6	1	0	10	0	0.570
8	3	1	3	7	1	0	7	0	0.259
8	3	1	3	8	1	0	3	0	0.121
8	3	1	3	9	1	0	4	0	0.142
8	3	1	3	10	1	0	5	0	0.151
8	3	1	3	11	1	0	10	0	0.468
8	3	1	3	12	1	0	3	0	0.096
8	3	1	3	13	1	0	8	0	0.551
8	3	1	3	14	1	0	8	0	0.379
8	3	1	3	15	1	0	4	0	0.087
8	3	1	3	16	1	0	1	0	0.015
8	3	1	3	17	1	0	6	0	0.265
8	3	1	3	18	1	0	5	0	0.186
8	3	1	3	19	1	0	7	0	0.267
8	3	1	3	20	1	0	5	0	0.202
8	3	2	1	1	1	0	11	0	0.672
8	3	2	1	2	1	0	9	0	0.625
8	3	2	1	3	1	0	6	0	0.402
8	3	2	1	4	1	0	12	0	0.716
8	3	2	1	5	1	0	10	0	0.465
8	3	2	1	6	1	0	11	0	0.592
8	3	2	1	7	1	0	16	0	1.337
8	3	2	1	8	1	0	8	0	0.386
8	3	2	1	9	1	0	12	0	0.832
8	3	2	1	10	1	0	9	0	0.440
8	3	2	1	11	1	0	19	1	2.039
8	3	2	1	12	1	0	1	0	0.015
8	3	2	1	13	2	8	8	0	0.490
8	3	2	1	14	1	0	1	0	0.039
8	3	2	1	15	1	0	6	0	0.183
8	3	2	1	16	1	0	17	0	1.253
8	3	2	1	17	1	0	20	0	1.635
8	3	2	1	18	1	0	3	0	0.138
8	3	2	1	19	1	0	14	0	0.848

A	B	C	D	E	F	G	H	I	J
8	3	2	1	20	1	0	14	0	1.016
8	3	2	2	1	1	0	19	0	1.496
8	3	2	2	2	1	0	8	0	0.424
8	3	2	2	3	1	0	8	0	0.919
8	3	2	2	4	1	0	15	0	1.626
8	3	2	2	5	1	0	20	0	0.658
8	3	2	2	6	1	0	12	0	1.596
8	3	2	2	7	1	0	20	0	2.325
8	3	2	2	8	1	0	31	1	1.067
8	3	2	2	9	1	0	18	0	0.622
8	3	2	2	10	1	0	9	0	0.167
8	3	2	2	11	3	21	7	0	1.315
8	3	2	2	12	1	0	15	0	1.040
8	3	2	2	13	1	0	21	0	1.708
8	3	2	2	14	2	8	7	0	0.238
8	3	2	2	15	1	0	3	0	0.093
8	3	2	2	16	1	0	16	0	1.255
8	3	2	2	17	1	0	10	0	0.470
8	3	2	2	18	1	0	10	0	0.552
8	3	2	2	19	1	0	9	0	0.422
8	3	2	2	20	1	0	16	0	1.149
8	3	2	3	1	1	0	6	0	0.323
8	3	2	3	2	1	0	9	0	0.646
8	3	2	3	3	2	8	3	0	0.113
8	3	2	3	4	1	0	9	0	0.395
8	3	2	3	5	1	0	9	0	0.457
8	3	2	3	6	1	0	15	0	0.834
8	3	2	3	7	1	0	4	0	0.104
8	3	2	3	8	1	0	9	0	0.496
8	3	2	3	9	1	0	13	0	0.780
8	3	2	3	10	1	0	6	0	0.321
8	3	2	3	11	1	0	12	0	0.814
8	3	2	3	12	2	8	5	0	0.121
8	3	2	3	13	1	0	13	0	0.789
8	3	2	3	14	2	8	3	0	0.087
8	3	2	3	15	1	0	10	0	0.608
8	3	2	3	16	1	0	3	0	0.048
8	3	2	3	17	2	8	6	0	0.242
8	3	2	3	18	1	0	7	0	0.413
8	3	2	3	19	2	8	3	0	0.085
8	4	1	1	1	2	8	9	0	0.554
8	4	1	1	2	1	0	17	0	1.402
8	4	1	1	3	1	0	10	0	0.892
8	4	1	1	4	1	0	4	0	0.141
8	4	1	1	5	1	0	11	0	0.781
8	4	1	1	6	1	0	12	0	0.931
8	4	1	1	7	1	0	6	0	0.487
8	4	1	1	8	1	0	11	0	0.805
8	4	1	1	9	2	8	4	0	0.219
8	4	1	1	10	1	0	13	1	1.606
8	4	1	1	11	1	0	5	0	0.194
8	4	1	1	12	1	0	3	0	0.133
8	4	1	1	13	1	0	9	0	0.465
8	4	1	1	14	1	0	11	0	0.627
8	4	1	1	15	1	0	5	0	0.197
8	4	1	1	16	1	0	14	1	1.215
8	4	1	1	17	1	0	10	0	0.902
8	4	1	1	18	1	0	10	0	0.904
8	4	1	1	19	1	0	5	0	0.214
8	4	1	1	20	1	0	9	0	0.755
8	4	1	2	1	1	0	16	0	1.370
8	4	1	2	2	1	0	14	0	0.974
8	4	1	2	3	1	0	9	0	0.648
8	4	1	2	4	2	8	3	0	0.121
8	4	1	2	5	1	0	9	0	0.642
8	4	1	2	6	1	0	6	0	0.402

A	B	C	D	E	F	G	H	I	J
8	4	1	2	7	2	8	7	0	0.286
8	4	1	2	8	1	0	7	0	0.428
8	4	1	2	9	1	0	8	0	0.320
8	4	1	2	10	1	0	15	0	1.372
8	4	1	2	11	1	0	10	0	0.716
8	4	1	2	12	1	0	7	0	0.433
8	4	1	2	13	1	0	11	0	0.831
8	4	1	2	14	1	0	8	0	0.483
8	4	1	2	15	1	0	17	1	1.848
8	4	1	2	16	1	0	17	0	1.537
8	4	1	2	17	1	0	9	0	0.616
8	4	1	2	18	1	0	13	0	1.207
8	4	1	2	19	1	0	10	0	0.624
8	4	1	2	20	1	0	7	0	0.517
8	4	1	3	1	1	0	25	0	2.042
8	4	1	3	2	1	0	7	0	0.648
8	4	1	3	3	1	0	13	0	0.973
8	4	1	3	4	1	0	9	0	0.474
8	4	1	3	5	2	8	9	0	0.803
8	4	1	3	6	1	0	13	0	1.106
8	4	1	3	7	1	0	4	0	0.170
8	4	1	3	8	1	0	10	0	0.485
8	4	1	3	9	1	0	4	0	0.254
8	4	1	3	10	1	0	15	0	0.959
8	4	1	3	11	1	0	8	0	0.502
8	4	1	3	12	1	0	8	0	0.508
8	4	1	3	13	1	0	16	0	1.420
8	4	1	3	14	1	0	17	0	1.171
8	4	1	3	15	1	0	15	0	0.977
8	4	1	3	16	1	0	10	0	0.542
8	4	1	3	17	1	0	16	0	1.498
8	4	1	3	18	1	0	5	0	0.215
8	4	1	3	19	1	0	7	0	0.232
8	4	1	3	20	1	0	14	0	0.811
8	4	2	1	1	1	0	13	0	0.882
8	4	2	1	2	1	0	15	0	0.977
8	4	2	1	3	2	8	9	0	0.352
8	4	2	1	4	1	0	4	0	0.080
8	4	2	1	5	1	0	5	0	0.147
8	4	2	1	6	1	0	5	0	0.234
8	4	2	1	7	2	8	11	0	0.836
8	4	2	1	8	1	0	7	0	0.401
8	4	2	1	9	1	0	14	0	0.828
8	4	2	1	10	1	0	11	0	0.686
8	4	2	1	11	1	0	11	0	0.825
8	4	2	1	12	2	8	6	0	0.383
8	4	2	1	13	1	0	11	1	0.847
8	4	2	1	14	1	0	4	0	0.201
8	4	2	1	15	1	0	7	0	0.417
8	4	2	1	16	1	0	7	0	0.370
8	4	2	1	17	1	0	12	0	0.745
8	4	2	1	18	1	0	9	0	0.459
8	4	2	1	19	1	0	14	0	0.955
8	4	2	1	20	1	0	11	0	0.644
8	4	2	2	1	2	8	8	0	0.308
8	4	2	2	2	1	0	1	0	0.018
8	4	2	2	3	1	0	12	0	0.683
8	4	2	2	4	1	0	10	0	0.654
8	4	2	2	5	1	0	16	0	1.098
8	4	2	2	6	1	0	16	0	1.101
8	4	2	2	7	1	0	13	0	0.848
8	4	2	2	8	1	0	13	0	0.892
8	4	2	2	9	1	0	9	0	0.382
8	4	2	2	10	1	0	10	0	0.513
8	4	2	2	11	1	0	12	0	0.586
8	4	2	2	12	1	0	19	0	1.145

A	B	C	D	E	F	G	H	I	J
8	4	2	2	13	1	0	7	0	0.420
8	4	2	2	14	1	0	17	0	0.952
8	4	2	2	15	1	0	22	0	1.762
8	4	2	2	16	1	0	13	0	0.680
8	4	2	2	17	1	0	13	0	0.562
8	4	2	2	18	1	0	7	0	0.428
8	4	2	2	19	1	0	7	0	0.225
8	4	2	2	20	1	0	17	0	0.689
8	4	2	3	1	1	0	10	0	0.331
8	4	2	3	2	1	0	12	0	0.654
8	4	2	3	3	1	0	15	0	0.609
8	4	2	3	4	1	0	11	0	0.477
8	4	2	3	5	1	0	16	0	0.817
8	4	2	3	6	1	0	8	0	0.542
8	4	2	3	7	1	0	10	0	0.626
8	4	2	3	8	1	0	3	0	0.140
8	4	2	3	9	1	0	8	0	0.460
8	4	2	3	10	1	0	18	0	1.260
8	4	2	3	11	1	0	20	0	1.671
8	4	2	3	12	1	0	8	0	0.491
8	4	2	3	13	1	0	7	0	0.242
8	4	2	3	14	1	0	10	0	0.631
8	4	2	3	15	1	0	12	0	0.657
8	4	2	3	16	1	0	9	0	0.442
8	4	2	3	17	1	0	18	1	1.548
8	4	2	3	18	3	21	7	0	0.260
8	4	2	3	19	1	0	17	1	1.795
8	4	2	3	20	1	0	7	0	0.200
8	5	1	1	1	1	0	7	0	0.288
8	5	1	1	2	1	0	9	0	0.516
8	5	1	1	3	1	0	10	0	0.526
8	5	1	1	4	1	0	6	0	0.176
8	5	1	1	5	1	0	1	0	0.026
8	5	1	1	6	1	0	4	0	0.201
8	5	1	1	7	1	0	7	0	0.477
8	5	1	1	8	1	0	9	0	0.528
8	5	1	1	9	1	0	5	0	0.252
8	5	1	1	10	1	0	7	0	0.307
8	5	1	1	11	1	0	3	0	0.078
8	5	1	1	12	1	0	5	0	0.214
8	5	1	1	13	2	8	4	0	0.123
8	5	1	1	14	1	0	4	0	0.107
8	5	1	1	15	1	0	1	0	0.008
8	5	1	1	16	3	21	1	0	0.022
8	5	1	1	17	1	0	4	0	0.192
8	5	1	1	18	1	0	2	0	0.059
8	5	1	1	19	3	21	1	0	0.017
8	5	1	1	20	1	0	2	0	0.034
8	5	1	2	1	1	0	6	0	0.287
8	5	1	2	2	3	21	3	0	0.057
8	5	1	2	3	1	0	3	0	0.052
8	5	1	2	4	1	0	3	0	0.102
8	5	1	2	5	3	21	2	0	0.026
8	5	1	2	6	1	0	3	0	0.091
8	5	1	2	7	1	0	7	0	0.239
8	5	1	2	8	1	0	7	0	0.142
8	5	1	2	9	1	0	5	0	0.135
8	5	1	2	10	1	0	6	0	0.208
8	5	1	2	11	1	0	4	0	0.130
8	5	1	3	1	1	0	4	0	0.108
8	5	1	3	2	3	21	2	0	0.039
8	5	1	3	3	3	21	2	0	0.043
8	5	1	3	4	2	8	4	0	0.147
8	5	1	3	5	2	8	2	0	0.033
8	5	1	3	6	1	0	19	0	0.901
8	5	1	3	7	1	0	6	0	0.245

A	B	C	D	E	F	G	H	I	J
8	5	1	3	8	2	8	3	0	0.114
8	5	2	1	1	3	21	5	0	0.195
8	5	2	1	2	1	0	7	0	0.275
8	5	2	1	3	2	8	3	0	0.065
8	5	2	1	4	1	0	6	0	0.228
8	5	2	1	5	1	0	7	0	0.432
8	5	2	1	6	1	0	9	0	0.615
8	5	2	1	7	2	8	4	0	0.165
8	5	2	1	8	1	0	8	0	0.415
8	5	2	1	9	1	0	12	0	0.727
8	5	2	1	10	1	0	7	0	0.390
8	5	2	1	11	1	0	5	0	0.213
8	5	2	1	12	2	8	4	0	0.180
8	5	2	1	13	1	0	8	0	0.445
8	5	2	1	14	1	0	4	0	0.144
8	5	2	1	15	1	0	7	0	0.357
8	5	2	1	16	1	0	9	0	0.431
8	5	2	1	17	1	0	2	0	0.042
8	5	2	1	18	1	0	3	0	0.099
8	5	2	1	19	1	0	5	0	0.156
8	5	2	1	20	1	0	3	0	0.089
8	5	2	2	1	1	0	8	0	0.324
8	5	2	2	2	1	0	8	0	0.377
8	5	2	2	3	1	0	10	0	0.377
8	5	2	2	4	1	0	8	0	0.293
8	5	2	2	5	1	0	9	0	0.333
8	5	2	2	6	1	0	13	0	0.660
8	5	2	2	7	1	0	8	0	0.278
8	5	2	2	8	1	0	17	0	0.906
8	5	2	2	9	1	0	8	0	0.239
8	5	2	2	10	1	0	8	0	0.221
8	5	2	2	11	1	0	13	0	0.491
8	5	2	2	12	1	0	10	0	0.373
8	5	2	2	13	1	0	11	0	0.400
8	5	2	2	14	1	0	4	0	0.097
8	5	2	2	15	1	0	10	0	0.550
8	5	2	2	16	1	0	15	0	0.541
8	5	2	2	17	1	0	17	0	0.749
8	5	2	2	18	3	21	3	0	0.033
8	5	2	2	19	1	0	14	0	0.549
8	5	2	2	20	1	0	9	0	0.419
8	5	2	3	1	1	0	8	0	0.657
8	5	2	3	2	1	0	7	0	0.235
8	5	2	3	3	1	0	8	0	0.383
8	5	2	3	4	1	0	7	0	0.317
8	5	2	3	5	1	0	7	0	0.352
8	5	2	3	6	1	0	11	0	0.568
8	5	2	3	7	1	0	8	0	0.256
8	5	2	3	8	1	0	11	0	0.607
8	5	2	3	9	2	8	3	0	0.134
8	5	2	3	10	1	0	3	0	0.096
8	5	2	3	11	1	0	8	0	0.319
8	5	2	3	12	1	0	7	0	0.323
8	5	2	3	13	1	0	7	0	0.295
8	5	2	3	14	1	0	3	0	0.103
8	5	2	3	15	1	0	10	0	0.438
8	5	2	3	16	3	21	6	0	0.163
8	5	2	3	17	1	0	7	0	0.346
8	5	2	3	18	3	21	2	0	0.056
8	5	2	3	19	1	0	13	0	0.509
8	5	2	3	20	1	0	12	0	0.630

Appendix 6 - Table 2

A - Species:

1 - *Agropyron dasystachyum*
2 - *Agropyron trachycaulum*
3 - *Bromus inermis*
4 - *Festuca hallii*
5 - *Stipa comata*
6 - *Stipa curtiseta*
7 - *Stipa viridula*
8 - *Stipa viridula* (Lodorm)

B - Site along the topographic gradient (1 = ridge, 5 = toe of slope)

C - Moisture Treatment

1 - Control
2 - Irrigated

D - Replicate Number

E - Sample Number

F - Cohort Number (germination date)

1 - June 5, 1989
2 - June 13, 1989
3 - June 26, 1989
4 - July 4, 1989
5 - July 18, 1989
6 - July 26, 1989
7 - August 10, 1989
8 - August 19, 1989 (Survivorship)
8 - September 3, 1989 (Germination)

G - Cohort Weighting (growing days after day 0 - June 5, 1989)

H - Number of Tillers/Individual

I - Number of Flowering Culms/Individual

J - Dry Weight (g)

Appendix 6 - Table 3

A - Species:
- 1 - *Agropyron dasystachyum*
- 2 - *Agropyron trachycaulum*
- 4 - *Festuca hallii*
- 5 - *Stipa comata*
- 6 - *Stipa curtiseta*
- 7 - *Stipa viridula*
- 8 - *Stipa viridula* (Lodorm)

B - Site along the topographic gradient (1 = ridge, 5 = toe of slope)

C - Moisture Treatment
- 1 - Control
- 2 - Previously irrigated (1989)

D - Replicate Number

E - Sample Number

F - Cohort Number (germination date)
- 1 - June 5, 1989
- 2 - June 13, 1989
- 3 - June 26, 1989
- 4 - July 4, 1989
- 5 - July 18, 1989
- 6 - July 26, 1989
- 7 - August 10, 1989
- 8 - August 19, 1989 (Survivorship)
- 8 - September 3, 1989 (Germination)
- 9 - May 17, 1990
- 9.5 - May 29, 1990
- 10 - July 26, 1990

G - Cohort Weighting (growing days after day 0 - June 5, 1989)

H - Number of Flowering Culms/Individual

I - Dry Weight (g)

Table 3. Individual data from field experiment including biomass and flowering culm data from 1990.

A	B	C	D	E	F	G	H	I
1	1	1	1	1	1	0	1	0.772
1	1	1	1	2	1	0	1	0.194
1	1	1	1	3	1	0	13	3.873
1	1	1	1	4	1	0	0	0.138
1	1	1	1	5	1	0	0	0.096
1	1	1	1	6	1	0	1	0.467
1	1	1	1	7	1	0	1	0.591
1	1	1	1	8	1	0	1	0.458
1	1	1	1	9	1	0	6	2.561
1	1	1	1	10	1	0	4	1.619
1	1	1	1	11	1	0	8	1.749
1	1	1	1	12	1	0	1	0.565
1	1	1	1	13	1	0	8	1.832
1	1	1	1	14	1	0	3	1.047
1	1	1	1	15	1	0	5	1.008
1	1	1	1	16	1	0	2	0.499
1	1	1	1	17	1	0	1	0.425
1	1	1	1	18	1	0	12	3.171
1	1	1	1	19	1	0	9	2.556
1	1	1	1	20	1	0	12	1.455
1	1	1	2	1	1	0	1	0.509
1	1	1	2	2	1	0	8	2.377
1	1	1	2	3	1	0	0	0.214
1	1	1	2	4	1	0	3	0.410
1	1	1	2	5	1	0	1	0.241
1	1	1	2	6	1	0	4	0.738
1	1	1	2	7	1	0	5	0.844
1	1	1	2	8	1	0	0	0.056
1	1	1	2	9	1	0	6	1.807
1	1	1	2	10	1	0	1	0.615
1	1	1	2	11	1	0	0	0.258
1	1	1	2	12	1	0	3	0.685
1	1	1	2	13	1	0	4	0.708
1	1	1	2	14	1	0	6	1.496
1	1	1	2	15	1	0	8	1.954
1	1	1	2	16	1	0	3	1.361
1	1	1	2	17	1	0	4	0.809
1	1	1	2	18	1	0	0	0.427
1	1	1	2	19	1	0	14	2.822
1	1	1	2	20	1	0	4	1.124
1	1	1	3	1	1	0	1	0.329
1	1	1	3	2	1	0	2	0.389
1	1	1	3	3	1	0	7	1.954
1	1	1	3	4	1	0	1	0.243
1	1	1	3	5	1	0	1	0.592
1	1	1	3	6	1	0	2	0.453
1	1	1	3	7	1	0	9	1.902
1	1	1	3	8	1	0	5	0.967
1	1	1	3	9	1	0	4	1.384
1	1	1	3	10	1	0	0	0.082
1	1	1	3	11	1	0	6	1.101
1	1	1	3	12	1	0	1	0.323
1	1	1	3	13	1	0	1	0.556
1	1	1	3	14	1	0	12	2.531
1	1	1	3	15	1	0	9	2.878
1	1	1	3	16	1	0	1	0.491
1	1	1	3	17	1	0	9	2.502
1	1	1	3	18	1	0	3	0.937
1	1	1	3	19	1	0	2	1.081
1	1	1	3	20	1	0	4	1.139
1	1	2	1	1	1	0	12	4.580
1	1	2	1	2	1	0	9	1.966
1	1	2	1	3	1	0	1	0.536
1	1	2	1	4	1	0	0	0.067
1	1	2	1	5	1	0	7	3.186
1	1	2	1	6	1	0	8	2.748
1	1	2	1	7	1	0	7	1.574
1	1	2	1	8	1	0	3	1.300
1	1	2	1	9	1	0	6	1.994
1	1	2	1	10	1	0	9	3.546
1	1	2	1	11	1	0	2	0.610
1	1	2	1	12	1	0	7	1.408
1	1	2	1	13	1	0	5	2.070
1	1	2	1	14	1	0	1	1.060
1	1	2	1	15	1	0	2	0.439
1	1	2	1	16	1	0	2	0.620
1	1	2	1	17	1	0	17	3.813
1	1	2	1	18	1	0	5	2.190
1	1	2	1	19	1	0	0	0.324
1	1	2	1	20	1	0	2	1.101
1	1	2	2	1	1	0	3	0.923
1	1	2	2	2	1	0	5	1.639
1	1	2	2	3	1	0	12	3.752
1	1	2	2	4	1	0	4	1.408
1	1	2	2	5	1	0	4	1.818
1	1	2	2	6	1	0	0	0.287
1	1	2	2	7	1	0	3	1.511
1	1	2	2	8	1	0	4	0.583
1	1	2	2	9	1	0	6	1.688
1	1	2	2	10	1	0	3	0.925
1	1	2	2	11	1	0	14	3.343
1	1	2	2	12	1	0	2	0.967
1	1	2	2	13	1	0	4	1.446
1	1	2	2	14	1	0	6	1.815
1	1	2	2	15	1	0	3	0.576
1	1	2	2	16	1	0	4	1.924
1	1	2	2	17	1	0	0	0.441
1	1	2	2	18	1	0	7	2.060
1	1	2	2	19	1	0	15	3.911
1	1	2	2	20	1	0	5	1.927
1	1	2	3	1	1	0	0	0.554
1	1	2	3	2	1	0	1	0.728
1	1	2	3	3	1	0	3	0.922
1	1	2	3	4	1	0	1	0.482
1	1	2	3	5	1	0	3	0.938
1	1	2	3	6	1	0	0	0.346
1	1	2	3	7	1	0	0	0.472
1	1	2	3	8	1	0	0	0.404
1	1	2	3	9	1	0	3	0.881
1	1	2	3	10	1	0	5	1.619
1	1	2	3	11	1	0	4	0.879
1	1	2	3	12	1	0	0	0.291
1	1	2	3	13	1	0	3	0.659
1	1	2	3	14	1	0	12	2.612
1	1	2	3	15	1	0	3	1.070
1	1	2	3	16	1	0	4	0.900
1	1	2	3	17	1	0	0	0.451
1	1	2	3	18	1	0	0	0.718
1	1	2	3	19	1	0	1	0.506
1	1	2	3	20	1	0	9	2.470
1	2	1	1	1	1	0	4	0.842
1	2	1	1	2	1	0	1	0.384
1	2	1	1	3	1	0	6	1.378
1	2	1	1	4	1	0	1	0.499
1	2	1	1	5	1	0	2	0.898
1	2	1	1	6	1	0	1	0.936
1	2	1	1	7	1	0	2	2.030
1	2	1	1	8	1	0	6	1.123
1	2	1	1	9	1	0	1	0.605

A	B	C	D	E	F	G	H	I
1	2	1	1	10	1	0	2	0.695
1	2	1	1	11	1	0	1	0.258
1	2	1	1	12	1	0	0	0.169
1	2	1	1	13	1	0	5	1.436
1	2	1	1	14	1	0	0	0.099
1	2	1	1	15	1	0	3	1.284
1	2	1	1	16	1	0	5	0.979
1	2	1	1	17	1	0	2	0.591
1	2	1	1	18	1	0	7	1.360
1	2	1	1	19	1	0	10	2.150
1	2	1	1	20	1	0	0	0.383
1	2	1	2	1	1	0	3	0.833
1	2	1	2	2	1	0	7	2.400
1	2	1	2	3	1	0	1	0.532
1	2	1	2	4	1	0	0	0.255
1	2	1	2	5	1	0	9	2.239
1	2	1	2	6	1	0	3	1.111
1	2	1	2	7	1	0	1	1.146
1	2	1	2	8	1	0	10	3.071
1	2	1	2	9	1	0	3	1.065
1	2	1	2	10	1	0	0	0.123
1	2	1	2	11	1	0	2	0.976
1	2	1	2	12	1	0	2	0.623
1	2	1	2	13	1	0	3	1.297
1	2	1	2	14	1	0	5	1.227
1	2	1	2	15	1	0	3	0.866
1	2	1	2	16	1	0	7	1.210
1	2	1	2	17	1	0	8	2.794
1	2	1	2	18	1	0	2	0.707
1	2	1	2	19	1	0	7	1.527
1	2	1	2	20	1	0	0	0.847
1	2	1	3	1	1	0	1	0.776
1	2	1	3	2	1	0	1	0.534
1	2	1	3	3	1	0	2	0.578
1	2	1	3	4	1	0	8	1.726
1	2	1	3	5	1	0	2	0.700
1	2	1	3	6	1	0	0	0.695
1	2	1	3	7	1	0	1	0.321
1	2	1	3	8	1	0	7	1.381
1	2	1	3	9	1	0	2	0.701
1	2	1	3	10	1	0	3	0.656
1	2	1	3	11	1	0	4	1.574
1	2	1	3	12	1	0	4	1.247
1	2	1	3	13	1	0	3	0.708
1	2	1	3	14	1	0	1	1.473
1	2	1	3	15	1	0	0	0.143
1	2	1	3	16	1	0	9	2.070
1	2	1	3	17	1	0	0	0.447
1	2	1	3	18	1	0	1	0.210
1	2	1	3	19	1	0	0	0.509
1	2	1	3	20	1	0	1	0.653
1	2	2	1	1	1	0	2	0.823
1	2	2	1	2	1	0	0	0.190
1	2	2	1	3	1	0	1	0.588
1	2	2	1	4	1	0	6	3.087
1	2	2	1	5	1	0	0	0.295
1	2	2	1	6	1	0	0	1.023
1	2	2	1	7	1	0	1	0.326
1	2	2	1	8	1	0	2	0.695
1	2	2	1	9	1	0	1	0.520
1	2	2	1	10	1	0	0	0.681
1	2	2	1	11	1	0	3	1.039
1	2	2	1	12	1	0	1	1.058
1	2	2	1	13	1	0	2	0.806
1	2	2	1	14	1	0	5	1.190
1	2	2	1	15	1	0	2	0.815
1	2	2	1	16	1	0	3	0.600
1	2	2	1	17	1	0	0	0.483
1	2	2	1	18	1	0	12	2.841
1	2	2	1	19	1	0	0	0.553
1	2	2	1	20	1	0	4	0.956
1	2	2	2	1	1	0	4	1.026
1	2	2	2	2	1	0	9	1.944
1	2	2	2	3	1	0	2	0.827
1	2	2	2	4	1	0	1	0.692
1	2	2	2	5	1	0	0	0.344
1	2	2	2	6	1	0	8	3.228
1	2	2	2	7	1	0	0	0.271
1	2	2	2	8	1	0	1	0.942
1	2	2	2	9	1	0	0	0.584
1	2	2	2	10	1	0	1	0.725
1	2	2	2	11	1	0	0	0.604
1	2	2	2	12	1	0	0	0.783
1	2	2	2	13	1	0	4	0.735
1	2	2	2	14	1	0	3	0.613
1	2	2	2	15	1	0	2	0.730
1	2	2	2	16	1	0	3	1.370
1	2	2	2	17	1	0	4	1.288
1	2	2	2	18	1	0	7	1.634
1	2	2	2	19	1	0	11	2.737
1	2	2	2	20	1	0	0	0.884
1	2	2	3	1	1	0	4	1.238
1	2	2	3	2	1	0	4	0.825
1	2	2	3	3	1	0	0	0.311
1	2	2	3	4	1	0	2	0.361
1	2	2	3	5	1	0	0	0.232
1	2	2	3	6	1	0	0	0.463
1	2	2	3	7	1	0	0	0.399
1	2	2	3	8	1	0	0	0.396
1	2	2	3	9	1	0	0	0.357
1	2	2	3	10	1	0	0	0.283
1	2	2	3	11	1	0	0	0.274
1	2	2	3	12	1	0	0	0.506
1	2	2	3	13	1	0	0	0.287
1	2	2	3	14	1	0	0	0.272
1	2	2	3	15	1	0	0	0.425
1	2	2	3	16	1	0	0	0.494
1	2	2	3	17	1	0	0	0.371
1	2	2	3	18	1	0	0	0.687
1	2	2	3	19	1	0	0	0.229
1	2	2	3	20	1	0	0	0.372
1	3	1	1	1	1	0	9	5.055
1	3	1	1	2	1	0	2	1.008
1	3	1	1	3	1	0	0	1.031
1	3	1	1	4	1	0	6	2.295
1	3	1	1	5	1	0	6	2.623
1	3	1	1	6	1	0	3	1.699
1	3	1	1	7	1	0	10	3.073
1	3	1	1	8	1	0	6	2.663
1	3	1	1	9	1	0	0	0.144
1	3	1	1	10	1	0	4	2.056
1	3	1	1	11	1	0	1	0.668
1	3	1	1	12	1	0	10	2.658
1	3	1	1	13	1	0	2	0.959
1	3	1	1	14	1	0	4	1.625
1	3	1	1	15	1	0	5	1.832
1	3	1	1	16	1	0	9	4.112
1	3	1	1	17	1	0	7	4.527
1	3	1	1	18	1	0	4	2.016
1	3	1	1	19	1	0	8	1.881
1	3	1	1	20	1	0	4	1.616
1	3	1	2	1	1	0	1	0.608

A	B	C	D	E	F	G	H	I
1	3	1	2	2	1	0	5	4.135
1	3	1	2	3	1	0	7	1.973
1	3	1	2	4	1	0	1	1.067
1	3	1	2	5	1	0	0	0.373
1	3	1	2	6	1	0	16	4.769
1	3	1	2	7	1	0	1	0.680
1	3	1	2	8	1	0	3	1.141
1	3	1	2	9	1	0	7	1.851
1	3	1	2	10	1	0	6	1.741
1	3	1	2	11	1	0	6	1.356
1	3	1	2	12	1	0	4	1.154
1	3	1	2	13	1	0	17	5.721
1	3	1	2	14	1	0	3	0.868
1	3	1	2	15	1	0	3	2.336
1	3	1	2	16	1	0	6	3.349
1	3	1	2	17	1	0	8	3.551
1	3	1	2	18	1	0	6	2.249
1	3	1	2	19	1	0	0	1.175
1	3	1	2	20	1	0	17	6.217
1	3	1	3	1	1	0	3	0.326
1	3	1	3	2	1	0	2	1.157
1	3	1	3	3	1	0	3	1.030
1	3	1	3	4	1	0	1	0.336
1	3	1	3	5	1	0	11	3.183
1	3	1	3	6	1	0	1	0.831
1	3	1	3	7	1	0	0	0.570
1	3	1	3	8	1	0	3	1.638
1	3	1	3	9	1	0	18	4.438
1	3	1	3	10	1	0	1	0.606
1	3	1	3	11	1	0	1	0.334
1	3	1	3	12	1	0	0	0.498
1	3	1	3	13	1	0	4	0.847
1	3	1	3	14	1	0	9	2.837
1	3	1	3	15	1	0	4	0.615
1	3	1	3	16	1	0	0	0.222
1	3	1	3	17	1	0	3	1.052
1	3	1	3	18	1	0	0	0.121
1	3	1	3	19	1	0	7	1.246
1	3	1	3	20	1	0	4	1.535
1	3	2	1	1	1	0	6	1.909
1	3	2	1	2	1	0	1	1.009
1	3	2	1	3	1	0	0	0.729
1	3	2	1	4	1	0	1	0.712
1	3	2	1	5	1	0	0	0.480
1	3	2	1	6	1	0	0	0.205
1	3	2	1	7	1	0	0	0.827
1	3	2	1	8	1	0	1	1.457
1	3	2	1	9	1	0	2	0.852
1	3	2	1	10	1	0	1	0.569
1	3	2	1	11	1	0	0	0.930
1	3	2	1	12	1	0	2	1.413
1	3	2	1	13	1	0	0	0.443
1	3	2	1	14	1	0	0	1.219
1	3	2	1	15	1	0	2	1.015
1	3	2	1	16	1	0	4	1.649
1	3	2	1	17	1	0	5	1.745
1	3	2	1	18	1	0	1	0.828
1	3	2	1	19	1	0	1	0.636
1	3	2	1	20	1	0	0	0.202
1	3	2	2	1	1	0	1	0.576
1	3	2	2	2	1	0	3	1.805
1	3	2	2	3	1	0	2	1.224
1	3	2	2	4	1	0	0	0.130
1	3	2	2	5	1	0	6	1.726
1	3	2	2	6	1	0	2	0.918
1	3	2	2	7	1	0	3	0.802

A	B	C	D	E	F	G	H	I
1	3	2	2	8	1	0	1	1.096
1	3	2	2	9	1	0	0	0.184
1	3	2	2	10	1	0	0	0.308
1	3	2	2	11	1	0	4	0.749
1	3	2	2	12	1	0	4	2.033
1	3	2	2	13	1	0	3	0.726
1	3	2	2	14	1	0	0	0.319
1	3	2	2	15	1	0	1	0.510
1	3	2	2	16	1	0	0	0.164
1	3	2	2	17	1	0	8	3.078
1	3	2	2	18	1	0	7	2.012
1	3	2	2	19	1	0	2	0.577
1	3	2	2	20	1	0	2	0.889
1	3	2	3	1	1	0	3	0.733
1	3	2	3	2	1	0	0	0.548
1	3	2	3	3	1	0	4	1.077
1	3	2	3	4	1	0	0	0.174
1	3	2	3	5	1	0	0	0.598
1	3	2	3	6	1	0	2	0.931
1	3	2	3	7	1	0	3	0.994
1	3	2	3	8	1	0	9	3.610
1	3	2	3	9	1	0	2	0.776
1	3	2	3	10	1	0	0	0.733
1	3	2	3	11	1	0	7	2.008
1	3	2	3	12	1	0	0	0.713
1	3	2	3	13	1	0	0	0.536
1	3	2	3	14	1	0	0	0.413
1	3	2	3	15	1	0	2	2.175
1	3	2	3	16	1	0	7	2.254
1	3	2	3	17	1	0	7	2.001
1	3	2	3	18	1	0	0	0.153
1	3	2	3	19	1	0	0	0.476
1	3	2	3	20	1	0	2	1.079
1	4	1	1	1	1	0	3	1.851
1	4	1	1	2	1	0	2	1.185
1	4	1	1	3	1	0	5	1.726
1	4	1	1	4	1	0	1	0.797
1	4	1	1	5	1	0	0	0.201
1	4	1	1	6	1	0	5	1.476
1	4	1	1	7	1	0	1	0.882
1	4	1	1	8	1	0	6	1.175
1	4	1	1	9	1	0	1	0.704
1	4	1	1	10	1	0	6	2.091
1	4	1	1	11	1	0	4	1.005
1	4	1	1	12	1	0	0	0.080
1	4	1	1	13	1	0	2	0.451
1	4	1	1	14	1	0	1	0.576
1	4	1	1	15	1	0	12	2.185
1	4	1	1	16	1	0	1	0.356
1	4	1	1	17	1	0	6	2.126
1	4	1	1	18	1	0	5	2.221
1	4	1	1	19	1	0	5	1.754
1	4	1	1	20	1	0	4	1.659
1	4	1	2	1	1	0	5	1.999
1	4	1	2	2	1	0	2	1.070
1	4	1	2	3	1	0	0	0.702
1	4	1	2	4	1	0	7	3.147
1	4	1	2	5	1	0	5	1.115
1	4	1	2	6	1	0	10	2.553
1	4	1	2	7	1	0	1	0.504
1	4	1	2	8	1	0	0	0.890
1	4	1	2	9	1	0	10	1.995
1	4	1	2	10	1	0	5	1.555
1	4	1	2	11	1	0	3	1.462
1	4	1	2	12	1	0	2	0.925
1	4	1	2	13	1	0	6	1.608

A	B	C	D	E	F	G	H	I
1	4	1	2	14	1	0	8	2.256
1	4	1	2	15	1	0	6	1.948
1	4	1	2	16	1	0	9	3.120
1	4	1	2	17	1	0	9	2.798
1	4	1	2	18	1	0	4	1.320
1	4	1	2	19	1	0	11	2.967
1	4	1	2	20	1	0	4	1.378
1	4	1	3	1	1	0	0	0.462
1	4	1	3	2	1	0	0	0.320
1	4	1	3	3	1	0	5	1.223
1	4	1	3	4	1	0	3	0.684
1	4	1	3	5	1	0	3	1.065
1	4	1	3	6	1	0	1	0.932
1	4	1	3	7	1	0	0	0.653
1	4	1	3	8	1	0	1	0.385
1	4	1	3	9	1	0	0	0.555
1	4	1	3	10	1	0	0	0.644
1	4	1	3	11	1	0	1	0.664
1	4	1	3	12	1	0	1	0.437
1	4	1	3	13	1	0	3	1.255
1	4	1	3	14	1	0	0	0.313
1	4	1	3	15	1	0	4	1.129
1	4	1	3	16	1	0	7	2.056
1	4	1	3	17	1	0	2	0.989
1	4	1	3	18	1	0	6	0.950
1	4	1	3	19	1	0	2	0.986
1	4	1	3	20	1	0	7	1.215
1	4	2	1	1	1	0	9	2.956
1	4	2	1	2	1	0	5	2.071
1	4	2	1	3	1	0	3	0.727
1	4	2	1	4	1	0	0	0.507
1	4	2	1	5	1	0	3	0.969
1	4	2	1	6	1	0	0	0.411
1	4	2	1	7	1	0	4	1.844
1	4	2	1	8	1	0	0	0.510
1	4	2	1	9	1	0	2	1.323
1	4	2	1	10	1	0	1	1.246
1	4	2	1	11	1	0	2	0.920
1	4	2	1	12	1	0	3	1.756
1	4	2	1	13	1	0	12	2.389
1	4	2	1	14	1	0	5	1.140
1	4	2	1	15	1	0	3	0.955
1	4	2	1	16	1	0	1	0.742
1	4	2	1	17	1	0	0	1.135
1	4	2	1	18	1	0	1	0.645
1	4	2	1	19	1	0	0	0.192
1	4	2	1	20	1	0	5	1.308
1	4	2	2	1	1	0	7	2.494
1	4	2	2	2	1	0	0	0.314
1	4	2	2	3	1	0	3	1.435
1	4	2	2	4	1	0	0	0.205
1	4	2	2	5	1	0	3	1.237
1	4	2	2	6	1	0	0	0.499
1	4	2	2	7	1	0	0	0.496
1	4	2	2	8	1	0	3	0.853
1	4	2	2	9	1	0	0	0.319
1	4	2	2	10	1	0	2	0.622
1	4	2	2	11	1	0	0	0.636
1	4	2	2	12	1	0	0	0.718
1	4	2	2	13	1	0	5	1.511
1	4	2	2	14	1	0	5	1.342
1	4	2	2	15	1	0	4	0.644
1	4	2	2	16	1	0	1	1.063
1	4	2	2	17	1	0	9	2.003
1	4	2	2	18	1	0	5	1.215
1	4	2	2	19	1	0	0	0.406
1	4	2	2	20	1	0	2	0.739
1	4	2	3	1	1	0	6	2.789
1	4	2	3	2	1	0	0	0.738
1	4	2	3	3	1	0	0	0.086
1	4	2	3	4	1	0	1	0.551
1	4	2	3	5	1	0	0	0.654
1	4	2	3	6	1	0	2	1.119
1	4	2	3	7	1	0	7	1.088
1	4	2	3	8	1	0	0	0.700
1	4	2	3	9	1	0	0	0.252
1	4	2	3	10	1	0	3	0.779
1	4	2	3	11	1	0	5	1.207
1	4	2	3	12	1	0	5	1.074
1	4	2	3	13	1	0	4	1.208
1	4	2	3	14	1	0	2	0.740
1	4	2	3	15	1	0	1	0.503
1	4	2	3	16	1	0	4	1.887
1	4	2	3	17	1	0	1	0.447
1	4	2	3	18	1	0	3	0.814
1	4	2	3	19	1	0	0	0.476
1	4	2	3	20	1	0	3	1.017
1	5	1	1	1	1	0	0	0.493
1	5	1	1	2	1	0	1	0.627
1	5	1	1	3	1	0	3	0.752
1	5	1	1	4	1	0	0	0.327
1	5	1	1	5	1	0	4	0.801
1	5	1	1	6	1	0	0	0.167
1	5	1	1	7	1	0	1	0.800
1	5	1	1	8	1	0	0	0.412
1	5	1	1	9	1	0	7	1.276
1	5	1	1	10	1	0	5	1.028
1	5	1	1	11	1	0	3	0.623
1	5	1	1	12	1	0	3	0.423
1	5	1	1	13	1	0	2	1.876
1	5	1	1	14	1	0	4	0.792
1	5	1	1	15	1	0	2	0.318
1	5	1	1	16	1	0	5	1.679
1	5	1	1	17	1	0	7	1.013
1	5	1	1	18	1	0	4	1.043
1	5	1	1	19	1	0	0	0.376
1	5	1	1	20	1	0	0	0.964
1	5	1	2	1	1	0	0	0.962
1	5	1	2	2	1	0	1	0.174
1	5	1	2	3	1	0	3	0.790
1	5	1	2	4	1	0	1	0.298
1	5	1	2	5	1	0	3	0.679
1	5	1	2	6	1	0	0	0.115
1	5	1	2	7	1	0	0	0.174
1	5	1	2	8	1	0	0	0.152
1	5	1	2	9	1	0	1	0.390
1	5	1	2	10	1	0	3	0.361
1	5	1	2	11	1	0	0	0.080
1	5	1	2	12	1	0	1	0.258
1	5	1	2	13	1	0	1	0.369
1	5	1	2	14	1	0	0	0.329
1	5	1	2	15	1	0	1	0.536
1	5	1	2	16	1	0	1	0.267
1	5	1	2	17	1	0	0	0.116
1	5	1	2	18	1	0	0	0.290
1	5	1	2	19	1	0	0	0.081
1	5	1	2	20	1	0	0	0.331
1	5	1	3	1	1	0	3	0.747
1	5	1	3	2	1	0	0	0.130
1	5	1	3	3	1	0	4	0.673
1	5	1	3	4	1	0	2	0.371
1	5	1	3	5	1	0	3	0.795

A	B	C	D	E	F	G	H	I
1	5	1	3	6	1	0	2	0.515
1	5	1	3	7	1	0	4	1.404
1	5	1	3	8	1	0	1	0.377
1	5	1	3	9	1	0	4	0.820
1	5	2	1	1	1	0	0	0.652
1	5	2	1	2	1	0	0	0.465
1	5	2	1	3	1	0	0	0.779
1	5	2	1	4	1	0	0	0.179
1	5	2	1	5	1	0	0	0.512
1	5	2	1	6	1	0	0	0.321
1	5	2	1	7	1	0	0	0.745
1	5	2	1	8	1	0	0	0.912
1	5	2	1	9	1	0	0	0.917
1	5	2	1	10	1	0	1	1.076
1	5	2	1	11	1	0	0	0.173
1	5	2	1	12	1	0	1	0.446
1	5	2	1	13	1	0	0	0.146
1	5	2	1	14	1	0	0	0.191
1	5	2	1	15	1	0	0	0.212
1	5	2	1	16	1	0	4	1.049
1	5	2	1	17	1	0	0	0.125
1	5	2	1	18	1	0	0	0.285
1	5	2	1	19	1	0	1	0.430
1	5	2	1	20	1	0	0	0.544
1	5	2	2	1	1	0	0	0.817
1	5	2	2	2	1	0	0	0.338
1	5	2	2	3	1	0	0	0.231
1	5	2	2	4	1	0	0	0.574
1	5	2	2	5	1	0	0	0.375
1	5	2	2	6	1	0	1	0.709
1	5	2	2	7	1	0	0	0.466
1	5	2	2	8	1	0	0	0.215
1	5	2	2	9	1	0	0	0.162
1	5	2	2	10	1	0	0	0.323
1	5	2	2	11	1	0	0	0.340
1	5	2	2	12	1	0	0	0.237
1	5	2	2	13	1	0	1	0.292
1	5	2	2	14	1	0	1	0.807
1	5	2	2	15	1	0	0	0.296
1	5	2	2	16	1	0	0	0.591
1	5	2	2	17	1	0	0	0.795
1	5	2	2	18	1	0	0	0.450
1	5	2	2	19	1	0	1	0.439
1	5	2	2	20	1	0	0	0.436
1	5	2	3	1	1	0	0	0.615
1	5	2	3	2	1	0	0	0.532
1	5	2	3	3	1	0	0	0.217
1	5	2	3	4	1	0	0	0.119
1	5	2	3	5	1	0	0	0.386
1	5	2	3	6	1	0	0	0.152
1	5	2	3	7	1	0	0	0.262
1	5	2	3	8	1	0	0	0.581
1	5	2	3	9	1	0	0	0.113
1	5	2	3	10	1	0	1	0.485
1	5	2	3	11	1	0	0	0.319
1	5	2	3	12	1	0	0	0.374
1	5	2	3	13	1	0	0	0.507
1	5	2	3	14	1	0	0	0.101
1	5	2	3	15	1	0	1	0.947
1	5	2	3	16	1	0	0	0.320
1	5	2	3	17	1	0	0	0.448
1	5	2	3	18	1	0	0	0.382
1	5	2	3	19	1	0	0	0.369
1	5	2	3	20	1	0	3	0.629
2	1	1	1	1	1	0	2	1.036
2	1	1	1	2	1	0	1	0.944
2	1	1	1	3	1	0	2	1.512
2	1	1	1	4	1	0	5	2.630
2	1	1	1	5	1	0	4	2.346
2	1	1	1	6	1	0	0	0.448
2	1	1	1	7	1	0	23	8.567
2	1	1	1	8	1	0	0	0.096
2	1	1	1	9	1	0	10	4.996
2	1	1	1	10	1	0	0	0.504
2	1	1	1	11	1	0	3	1.543
2	1	1	1	12	1	0	0	0.779
2	1	1	1	13	1	0	0	0.309
2	1	1	1	14	1	0	6	4.039
2	1	1	1	15	1	0	0	0.524
2	1	1	1	16	1	0	8	5.381
2	1	1	1	17	1	0	0	0.898
2	1	1	1	18	1	0	10	5.968
2	1	1	1	19	1	0	0	0.273
2	1	1	1	20	1	0	0	0.337
2	1	1	2	1	1	0	3	1.665
2	1	1	2	2	1	0	6	2.408
2	1	1	2	3	1	0	1	0.944
2	1	1	2	4	1	0	2	1.091
2	1	1	2	5	1	0	6	2.607
2	1	1	2	6	1	0	0	0.228
2	1	1	2	7	1	0	0	0.240
2	1	1	2	8	1	0	2	0.633
2	1	1	2	9	1	0	0	0.743
2	1	1	2	10	1	0	0	0.525
2	1	1	2	11	1	0	10	3.767
2	1	1	2	12	1	0	3	1.963
2	1	1	2	13	1	0	4	2.062
2	1	1	2	14	1	0	2	1.211
2	1	1	2	15	1	0	2	1.129
2	1	1	2	16	1	0	14	5.064
2	1	1	2	17	1	0	2	1.750
2	1	1	2	18	1	0	2	0.721
2	1	1	2	19	1	0	10	4.472
2	1	1	2	20	1	0	0	0.344
2	1	1	3	1	1	0	3	1.035
2	1	1	3	2	1	0	17	7.448
2	1	1	3	3	1	0	9	3.129
2	1	1	3	4	1	0	4	1.771
2	1	1	3	5	1	0	26	15.478
2	1	1	3	6	1	0	1	1.147
2	1	1	3	7	1	0	3	1.731
2	1	1	3	8	1	0	3	1.135
2	1	1	3	9	1	0	13	5.276
2	1	1	3	10	1	0	6	3.109
2	1	1	3	11	1	0	2	1.118
2	1	1	3	12	1	0	9	3.727
2	1	1	3	13	1	0	4	1.233
2	1	1	3	14	1	0	7	3.360
2	1	1	3	15	1	0	1	0.704
2	1	1	3	16	1	0	1	1.843
2	1	1	3	17	1	0	2	0.969
2	1	1	3	18	1	0	3	1.217
2	1	1	3	19	1	0	4	2.702
2	1	1	3	20	1	0	24	9.122
2	1	2	1	1	1	0	5	1.960
2	1	2	1	2	1	0	3	2.055
2	1	2	1	3	1	0	1	0.864
2	1	2	1	4	1	0	0	0.463
2	1	2	1	5	1	0	1	1.251
2	1	2	1	6	1	0	0	1.176
2	1	2	1	7	1	0	1	1.023
2	1	2	1	8	1	0	1	1.212

A	B	C	D	E	F	G	H	I
2	1	2	1	9	1	0	2	1.004
2	1	2	1	10	1	0	1	2.064
2	1	2	1	11	1	0	1	0.944
2	1	2	1	12	1	0	1	1.949
2	1	2	1	13	1	0	4	2.068
2	1	2	1	14	1	0	5	1.867
2	1	2	1	15	1	0	5	2.533
2	1	2	1	16	1	0	6	2.547
2	1	2	1	17	1	0	0	0.915
2	1	2	1	18	1	0	2	1.852
2	1	2	1	19	1	0	5	2.814
2	1	2	1	20	1	0	0	0.395
2	1	2	2	1	1	0	0	0.492
2	1	2	2	2	1	0	11	4.474
2	1	2	2	3	1	0	7	2.909
2	1	2	2	4	1	0	0	0.563
2	1	2	2	5	1	0	1	0.344
2	1	2	2	6	1	0	0	0.286
2	1	2	2	7	1	0	4	1.926
2	1	2	2	8	1	0	0	0.267
2	1	2	2	9	1	0	6	2.558
2	1	2	2	10	1	0	7	3.080
2	1	2	2	11	1	0	0	0.518
2	1	2	2	12	1	0	5	2.158
2	1	2	2	13	1	0	0	0.638
2	1	2	2	14	1	0	5	2.986
2	1	2	2	15	1	0	6	3.442
2	1	2	2	16	1	0	0	0.765
2	1	2	2	17	1	0	1	0.719
2	1	2	2	18	1	0	7	3.707
2	1	2	2	19	1	0	6	2.251
2	1	2	2	20	1	0	2	0.796
2	1	2	3	1	1	0	0	0.386
2	1	2	3	2	1	0	10	0.104
2	1	2	3	3	1	0	0	0.857
2	1	2	3	4	1	0	3	0.481
2	1	2	3	5	1	0	1	1.149
2	1	2	3	6	1	0	0	0.356
2	1	2	3	7	1	0	5	0.905
2	1	2	3	8	1	0	0	0.957
2	1	2	3	9	1	0	0	0.462
2	1	2	3	10	1	0	0	4.082
2	1	2	3	11	1	0	0	0.139
2	1	2	3	12	1	0	0	0.233
2	1	2	3	13	1	0	0	0.431
2	1	2	3	14	1	0	11	3.820
2	1	2	3	15	1	0	6	5.383
2	1	2	3	16	1	0	3	0.973
2	1	2	3	17	1	0	4	1.807
2	1	2	3	18	1	0	5	1.648
2	1	2	3	19	1	0	14	5.869
2	1	2	3	20	1	0	14	4.859
2	2	1	1	1	1	0	9	3.299
2	2	1	1	2	1	0	3	1.003
2	2	1	1	3	1	0	0	0.827
2	2	1	1	4	1	0	1	1.647
2	2	1	1	5	1	0	3	0.882
2	2	1	1	6	1	0	3	0.894
2	2	1	1	7	1	0	2	0.969
2	2	1	1	8	1	0	0	0.541
2	2	1	1	9	1	0	0	0.658
2	2	1	1	10	1	0	4	1.873
2	2	1	1	11	1	0	2	0.840
2	2	1	1	12	1	0	0	0.081
2	2	1	1	13	1	0	0	0.198
2	2	1	1	14	1	0	6	2.146

A	B	C	D	E	F	G	H	I
2	2	1	1	15	1	0	1	0.675
2	2	1	1	16	1	0	1	0.275
2	2	1	1	17	1	0	0	0.916
2	2	1	1	18	1	0	0	0.486
2	2	1	1	19	1	0	1	1.805
2	2	1	1	20	1	0	5	2.292
2	2	1	2	1	1	0	7	2.862
2	2	1	2	2	1	0	6	2.476
2	2	1	2	3	1	0	3	0.869
2	2	1	2	4	1	0	7	2.611
2	2	1	2	5	1	0	3	0.870
2	2	1	2	6	1	0	0	0.868
2	2	1	2	7	1	0	1	0.591
2	2	1	2	8	1	0	3	1.309
2	2	1	2	9	1	0	5	1.882
2	2	1	2	10	1	0	7	2.534
2	2	1	2	11	1	0	8	2.949
2	2	1	2	12	1	0	2	1.404
2	2	1	2	13	1	0	8	3.061
2	2	1	2	14	1	0	1	0.912
2	2	1	2	15	1	0	2	0.939
2	2	1	2	16	1	0	2	1.688
2	2	1	2	17	1	0	5	2.046
2	2	1	2	18	1	0	4	1.446
2	2	1	2	19	1	0	3	0.774
2	2	1	2	20	1	0	2	0.935
2	2	1	3	1	1	0	0	0.412
2	2	1	3	2	1	0	1	0.703
2	2	1	3	3	1	0	1	0.441
2	2	1	3	4	1	0	0	0.502
2	2	1	3	5	1	0	7	3.052
2	2	1	3	6	1	0	1	0.553
2	2	1	3	7	1	0	3	1.271
2	2	1	3	8	1	0	0	0.402
2	2	1	3	9	1	0	9	3.495
2	2	1	3	10	1	0	0	0.817
2	2	1	3	11	1	0	3	0.960
2	2	1	3	12	1	0	5	1.898
2	2	1	3	13	1	0	4	1.528
2	2	1	3	14	1	0	4	0.923
2	2	1	3	15	1	0	2	0.696
2	2	1	3	16	1	0	3	0.726
2	2	1	3	17	1	0	10	4.008
2	2	1	3	18	1	0	0	0.351
2	2	1	3	19	1	0	0	0.215
2	2	1	3	20	1	0	5	1.499
2	2	2	1	1	1	0	2	1.637
2	2	2	1	2	1	0	2	1.333
2	2	2	1	3	1	0	1	1.123
2	2	2	1	4	1	0	2	1.195
2	2	2	1	5	1	0	0	0.694
2	2	2	1	6	1	0	1	0.889
2	2	2	1	7	1	0	2	1.004
2	2	2	1	8	1	0	1	1.042
2	2	2	1	9	1	0	0	0.509
2	2	2	1	10	1	0	0	0.212
2	2	2	1	11	1	0	0	0.293
2	2	2	1	12	1	0	2	0.714
2	2	2	1	13	1	0	0	0.958
2	2	2	1	14	1	0	0	0.421
2	2	2	1	15	1	0	1	1.224
2	2	2	1	16	1	0	1	1.120
2	2	2	1	17	1	0	2	1.428
2	2	2	1	18	1	0	0	0.798
2	2	2	1	19	1	0	1	0.252
2	2	2	1	20	1	0	3	2.375

A	B	C	D	E	F	G	H	I
2	2	2	2	1	1	0	3	1.347
2	2	2	2	2	1	0	2	1.887
2	2	2	2	3	1	0	2	0.923
2	2	2	2	4	1	0	3	1.400
2	2	2	2	5	1	0	0	0.454
2	2	2	2	6	1	0	0	0.609
2	2	2	2	7	1	0	0	0.909
2	2	2	2	8	1	0	0	2.992
2	2	2	2	9	1	0	0	0.615
2	2	2	2	10	1	0	0	0.771
2	2	2	2	11	1	0	0	0.974
2	2	2	2	12	1	0	0	0.599
2	2	2	2	13	1	0	0	2.226
2	2	2	2	14	1	0	5	3.055
2	2	2	2	15	1	0	1	1.188
2	2	2	2	16	1	0	6	3.656
2	2	2	2	17	1	0	5	3.900
2	2	2	2	18	1	0	0	1.246
2	2	2	2	19	1	0	5	2.855
2	2	2	2	20	1	0	2	1.382
2	2	2	3	1	1	0	0	1.292
2	2	2	3	2	1	0	0	0.626
2	2	2	3	3	1	0	0	0.852
2	2	2	3	4	1	0	2	2.404
2	2	2	3	5	1	0	2	1.054
2	2	2	3	6	1	0	0	0.520
2	2	2	3	7	1	0	0	0.552
2	2	2	3	8	1	0	0	0.410
2	2	2	3	9	1	0	0	0.141
2	2	2	3	10	1	0	2	0.545
2	2	2	3	11	1	0	2	0.691
2	2	2	3	12	1	0	0	0.372
2	2	2	3	13	1	0	0	0.462
2	2	2	3	14	1	0	0	0.355
2	2	2	3	15	1	0	0	0.517
2	2	2	3	16	1	0	2	0.699
2	2	2	3	17	1	0	0	1.151
2	2	2	3	18	1	0	2	1.565
2	2	2	3	19	1	0	1	0.564
2	2	2	3	20	1	0	2	1.024
2	3	1	1	1	2	8	4	1.584
2	3	1	1	2	2	8	7	5.069
2	3	1	1	3	2	8	3	1.143
2	3	1	1	4	2	8	3	0.714
2	3	1	1	5	2	8	3	0.980
2	3	1	1	6	2	8	2	1.021
2	3	1	1	7	2	8	3	1.852
2	3	1	1	8	2	8	0	0.082
2	3	1	1	9	2	8	4	1.801
2	3	1	1	10	2	8	1	0.341
2	3	1	1	11	2	8	0	0.115
2	3	1	1	12	2	8	0	0.181
2	3	1	1	13	2	8	4	1.407
2	3	1	1	14	2	8	0	0.038
2	3	1	1	15	2	8	4	2.529
2	3	1	1	16	2	8	10	3.088
2	3	1	1	17	1	0	7	3.559
2	3	1	1	18	1	0	8	2.691
2	3	1	1	19	1	0	6	3.071
2	3	1	1	20	1	0	7	3.082
2	3	1	2	1	2	8	14	8.409
2	3	1	2	2	2	8	4	3.136
2	3	1	2	3	2	8	2	0.687
2	3	1	2	4	2	8	7	4.381
2	3	1	2	5	2	8	13	7.468
2	3	1	2	6	2	8	2	0.531
2	3	1	2	7	2	8	1	0.304
2	3	1	2	8	2	8	9	5.216
2	3	1	2	9	2	8	1	0.194
2	3	1	2	10	2	8	3	0.958
2	3	1	2	11	2	8	12	5.263
2	3	1	2	12	3	21	5	2.357
2	3	1	2	13	3	21	6	3.101
2	3	1	2	14	3	21	2	0.659
2	3	1	2	15	3	21	5	3.427
2	3	1	2	16	3	21	9	4.389
2	3	1	2	17	3	21	17	8.904
2	3	1	2	18	3	21	1	0.287
2	3	1	2	19	3	21	1	0.498
2	3	1	2	20	3	21	6	2.388
2	3	1	3	1	2	8	8	3.695
2	3	1	3	2	2	8	1	0.348
2	3	1	3	3	2	8	0	0.194
2	3	1	3	4	2	8	2	0.600
2	3	1	3	5	2	8	12	7.112
2	3	1	3	6	2	8	3	1.051
2	3	1	3	7	2	8	8	4.879
2	3	1	3	8	2	8	3	0.654
2	3	1	3	9	2	8	1	0.238
2	3	1	3	10	2	8	2	0.722
2	3	1	3	11	2	8	1	0.295
2	3	1	3	12	2	8	1	0.223
2	3	1	3	13	2	8	2	0.645
2	3	1	3	14	2	8	6	2.266
2	3	1	3	15	2	8	3	1.346
2	3	1	3	16	2	8	2	0.765
2	3	1	3	17	2	8	1	0.498
2	3	1	3	18	2	8	2	0.728
2	3	1	3	19	2	8	1	0.600
2	3	1	3	20	2	8	2	0.739
2	3	2	1	1	1	0	5	2.307
2	3	2	1	2	1	0	4	1.177
2	3	2	1	3	1	0	1	0.335
2	3	2	1	4	1	0	7	3.032
2	3	2	1	5	1	0	7	3.864
2	3	2	1	6	1	0	5	2.123
2	3	2	1	7	1	0	1	0.975
2	3	2	1	8	1	0	3	2.060
2	3	2	1	9	1	0	2	0.734
2	3	2	1	10	1	0	8	3.437
2	3	2	1	11	1	0	8	3.652
2	3	2	1	12	1	0	4	1.557
2	3	2	1	13	1	0	2	1.095
2	3	2	1	14	1	0	10	4.791
2	3	2	1	15	1	0	3	1.630
2	3	2	1	16	1	0	1	0.689
2	3	2	1	17	1	0	2	0.429
2	3	2	1	18	1	0	1	1.405
2	3	2	1	19	1	0	0	0.237
2	3	2	1	20	1	0	2	0.834
2	3	2	2	1	1	0	4	1.360
2	3	2	2	2	1	0	3	0.825
2	3	2	2	3	1	0	2	1.393
2	3	2	2	4	1	0	3	0.886
2	3	2	2	5	1	0	3	1.233
2	3	2	2	6	1	0	0	0.303
2	3	2	2	7	1	0	2	1.503
2	3	2	2	8	1	0	5	2.425
2	3	2	2	9	1	0	0	0.402
2	3	2	2	10	1	0	5	0.287
2	3	2	2	11	1	0	0	2.713
2	3	2	2	12	1	0	2	0.119

A	B	C	D	E	F	G	H	I
2	3	2	2	13	1	0	2	0.657
2	3	2	2	14	1	0	0	0.681
2	3	2	2	15	1	0	0	0.350
2	3	2	2	16	1	0	2	0.872
2	3	2	2	17	1	0	4	1.837
2	3	2	2	18	1	0	4	1.248
2	3	2	2	19	1	0	0	0.414
2	3	2	2	20	1	0	2	0.809
2	3	2	3	1	1	0	1	0.175
2	3	2	3	2	1	0	2	0.969
2	3	2	3	3	1	0	4	1.521
2	3	2	3	4	1	0	2	1.616
2	3	2	3	5	1	0	4	2.547
2	3	2	3	6	1	0	0	0.576
2	3	2	3	7	1	0	1	0.740
2	3	2	3	8	1	0	3	1.347
2	3	2	3	9	1	0	2	0.769
2	3	2	3	10	1	0	2	0.978
2	3	2	3	11	1	0	2	0.972
2	3	2	3	12	1	0	0	0.177
2	3	2	3	13	1	0	4	1.474
2	3	2	3	14	1	0	1	0.593
2	3	2	3	15	1	0	7	3.575
2	3	2	3	16	1	0	4	2.667
2	3	2	3	17	1	0	3	1.690
2	3	2	3	18	1	0	1	1.040
2	3	2	3	19	1	0	4	2.622
2	3	2	3	20	1	0	3	1.223
2	4	1	1	1	1	0	0	0.712
2	4	1	1	2	1	0	1	2.046
2	4	1	1	3	1	0	5	2.336
2	4	1	1	4	1	0	2	2.473
2	4	1	1	5	1	0	2	1.159
2	4	1	1	6	1	0	2	1.591
2	4	1	1	7	1	0	1	2.307
2	4	1	1	8	1	0	0	0.062
2	4	1	1	9	1	0	2	1.484
2	4	1	1	10	1	0	3	2.514
2	4	1	1	11	1	0	0	0.561
2	4	1	1	12	1	0	0	1.538
2	4	1	1	13	1	0	3	2.102
2	4	1	1	14	1	0	1	0.368
2	4	1	1	15	1	0	6	2.893
2	4	1	1	16	1	0	5	3.191
2	4	1	1	17	1	0	0	1.613
2	4	1	1	18	1	0	0	1.004
2	4	1	1	19	1	0	2	1.413
2	4	1	1	20	1	0	2	1.497
2	4	1	2	1	1	0	5	1.467
2	4	1	2	2	1	0	4	1.431
2	4	1	2	3	1	0	0	1.285
2	4	1	2	4	1	0	9	4.236
2	4	1	2	5	1	0	4	1.953
2	4	1	2	6	1	0	2	1.205
2	4	1	2	7	1	0	2	1.565
2	4	1	2	8	1	0	2	1.745
2	4	1	2	9	1	0	6	2.494
2	4	1	2	10	1	0	14	7.472
2	4	1	2	11	1	0	8	4.008
2	4	1	2	12	1	0	2	0.867
2	4	1	2	13	1	0	2	1.577
2	4	1	2	14	1	0	0	0.566
2	4	1	2	15	1	0	2	2.541
2	4	1	2	16	1	0	8	5.788
2	4	1	2	17	1	0	4	1.980
2	4	1	2	18	1	0	2	2.143
2	4	1	2	19	1	0	5	1.954
2	4	1	2	20	1	0	9	3.919
2	4	1	3	1	1	0	10	6.057
2	4	1	3	2	1	0	4	2.815
2	4	1	3	3	1	0	5	2.331
2	4	1	3	4	1	0	3	1.180
2	4	1	3	5	1	0	3	1.518
2	4	1	3	6	1	0	4	3.031
2	4	1	3	7	1	0	1	0.284
2	4	1	3	8	1	0	2	1.846
2	4	1	3	9	1	0	9	4.757
2	4	1	3	10	1	0	11	6.785
2	4	1	3	11	1	0	6	4.627
2	4	1	3	12	1	0	10	5.651
2	4	1	3	13	1	0	12	8.403
2	4	1	3	14	1	0	22	16.993
2	4	1	3	15	1	0	7	3.365
2	4	1	3	16	1	0	21	11.425
2	4	1	3	17	1	0	2	1.457
2	4	1	3	18	1	0	8	3.773
2	4	1	3	19	1	0	9	3.604
2	4	1	3	20	1	0	9	4.178
2	4	2	1	1	1	0	4	1.494
2	4	2	1	2	1	0	3	1.301
2	4	2	1	3	1	0	2	3.246
2	4	2	1	4	1	0	2	1.265
2	4	2	1	5	1	0	1	0.963
2	4	2	1	6	1	0	3	1.968
2	4	2	1	7	1	0	0	0.573
2	4	2	1	8	1	0	0	0.358
2	4	2	1	9	1	0	2	2.116
2	4	2	1	10	1	0	2	2.085
2	4	2	1	11	1	0	0	1.242
2	4	2	1	12	1	0	1	1.846
2	4	2	1	13	1	0	1	0.573
2	4	2	1	14	1	0	2	0.984
2	4	2	1	15	1	0	0	0.805
2	4	2	1	16	1	0	5	2.506
2	4	2	1	17	1	0	2	1.918
2	4	2	1	18	1	0	2	1.931
2	4	2	1	19	1	0	4	2.041
2	4	2	1	20	1	0	3	1.586
2	4	2	2	1	1	0	0	0.244
2	4	2	2	2	1	0	7	4.266
2	4	2	2	3	1	0	4	1.911
2	4	2	2	4	1	0	7	4.992
2	4	2	2	5	1	0	4	1.762
2	4	2	2	6	1	0	5	3.284
2	4	2	2	7	1	0	4	2.508
2	4	2	2	8	1	0	1	0.788
2	4	2	2	9	1	0	4	1.431
2	4	2	2	10	1	0	6	2.366
2	4	2	2	11	1	0	2	1.027
2	4	2	2	12	1	0	9	5.502
2	4	2	2	13	1	0	3	1.597
2	4	2	2	14	1	0	6	2.735
2	4	2	2	15	1	0	9	4.969
2	4	2	2	16	1	0	6	2.304
2	4	2	2	17	1	0	4	1.742
2	4	2	2	18	1	0	3	0.960
2	4	2	2	19	1	0	4	1.894
2	4	2	2	20	1	0	3	1.833
2	4	2	3	1	1	0	6	3.512
2	4	2	3	2	1	0	4	2.353
2	4	2	3	3	1	0	5	2.472
2	4	2	3	4	1	0	0	0.132

A	B	C	D	E	F	G	H	I
2	4	2	3	5	1	0	3	1.116
2	4	2	3	6	1	0	8	2.866
2	4	2	3	7	1	0	4	1.587
2	4	2	3	8	1	0	7	3.338
2	4	2	3	9	1	0	1	0.413
2	4	2	3	10	1	0	0	0.300
2	4	2	3	11	1	0	9	4.155
2	4	2	3	12	1	0	9	3.611
2	4	2	3	13	1	0	6	2.240
2	4	2	3	14	1	0	7	3.165
2	4	2	3	15	1	0	10	5.242
2	4	2	3	16	1	0	6	2.931
2	4	2	3	17	1	0	4	1.723
2	4	2	3	18	1	0	4	1.834
2	4	2	3	19	1	0	6	2.785
2	4	2	3	20	1	0	7	3.936
2	5	1	1	1	1	0	4	2.824
2	5	1	1	2	1	0	13	9.568
2	5	1	1	3	1	0	3	1.476
2	5	1	1	4	1	0	7	3.687
2	5	1	1	5	1	0	7	4.937
2	5	1	1	6	1	0	20	9.509
2	5	1	1	7	1	0	20	11.303
2	5	1	1	8	1	0	23	13.470
2	5	1	1	9	1	0	12	6.821
2	5	1	1	10	1	0	6	2.380
2	5	1	1	11	1	0	4	1.892
2	5	1	1	12	1	0	19	11.518
2	5	1	1	13	1	0	2	0.937
2	5	1	1	14	1	0	11	7.296
2	5	1	1	15	2	8	2	1.372
2	5	1	1	16	2	8	0	0.212
2	5	1	1	17	2	8	7	4.061
2	5	1	1	18	2	8	2	2.410
2	5	1	1	19	2	8	5	2.477
2	5	1	1	20	2	8	4	1.594
2	5	1	2	1	2	8	12	7.761
2	5	1	2	2	2	8	2	1.329
2	5	1	2	3	2	8	2	0.892
2	5	1	2	4	2	8	3	2.507
2	5	1	2	5	2	8	2	0.799
2	5	1	2	6	2	8	5	2.504
2	5	1	2	7	2	8	4	2.745
2	5	1	2	8	2	8	1	0.639
2	5	1	2	9	2	8	4	2.789
2	5	1	2	10	2	8	0	0.125
2	5	1	2	11	2	8	7	2.548
2	5	1	2	12	2	8	4	2.039
2	5	1	2	13	2	8	9	3.909
2	5	1	2	14	2	8	10	4.981
2	5	1	2	15	2	8	1	0.719
2	5	1	2	16	2	8	10	5.315
2	5	1	2	17	2	8	3	1.206
2	5	1	2	18	2	8	2	0.289
2	5	1	2	19	2	8	7	2.162
2	5	1	2	20	2	8	4	1.407
2	5	1	3	1	1	0	2	0.708
2	5	1	3	2	1	0	3	0.872
2	5	1	3	3	1	0	4	1.450
2	5	1	3	4	1	0	4	2.153
2	5	1	3	5	1	0	6	4.971
2	5	1	3	6	1	0	2	0.775
2	5	1	3	7	1	0	9	4.710
2	5	1	3	8	1	0	9	3.680
2	5	1	3	9	1	0	4	1.583
2	5	1	3	10	1	0	5	1.941
2	5	1	3	11	1	0	7	3.745
2	5	1	3	12	1	0	8	3.689
2	5	1	3	13	1	0	10	4.206
2	5	1	3	14	1	0	5	2.171
2	5	1	3	15	1	0	1	0.184
2	5	1	3	16	1	0	5	1.941
2	5	1	3	17	1	0	14	15.031
2	5	1	3	18	1	0	6	3.200
2	5	1	3	19	1	0	4	1.836
2	5	1	3	20	1	0	14	5.654
2	5	2	1	1	1	0	2	1.004
2	5	2	1	2	1	0	2	2.102
2	5	2	1	3	1	0	5	2.389
2	5	2	1	4	1	0	2	1.764
2	5	2	1	5	1	0	3	1.578
2	5	2	1	6	1	0	3	0.769
2	5	2	1	7	1	0	3	1.492
2	5	2	1	8	1	0	3	1.193
2	5	2	1	9	1	0	2	0.528
2	5	2	1	10	1	0	4	1.219
2	5	2	1	11	1	0	4	1.793
2	5	2	1	12	1	0	7	4.048
2	5	2	1	13	1	0	8	5.572
2	5	2	1	14	1	0	5	4.023
2	5	2	1	15	1	0	5	4.327
2	5	2	1	16	1	0	2	0.942
2	5	2	1	17	1	0	8	4.217
2	5	2	2	1	1	0	4	1.888
2	5	2	2	2	1	0	3	1.357
2	5	2	2	3	1	0	3	1.398
2	5	2	2	4	1	0	1	0.975
2	5	2	2	5	1	0	3	2.032
2	5	2	2	6	1	0	4	2.428
2	5	2	2	7	1	0	5	3.252
2	5	2	2	8	1	0	8	4.180
2	5	2	2	9	1	0	0	0.256
2	5	2	2	10	1	0	4	1.672
2	5	2	2	11	1	0	4	1.707
2	5	2	2	12	1	0	2	1.677
2	5	2	2	13	1	0	0	0.511
2	5	2	2	14	1	0	2	1.314
2	5	2	2	15	1	0	3	1.021
2	5	2	2	16	1	0	2	1.089
2	5	2	2	17	1	0	5	1.410
2	5	2	2	18	1	0	2	1.340
2	5	2	2	19	1	0	4	1.743
2	5	2	2	20	1	0	2	1.063
2	5	2	3	1	1	0	7	3.501
2	5	2	3	2	1	0	4	1.178
2	5	2	3	3	1	0	3	1.508
2	5	2	3	4	1	0	6	2.255
2	5	2	3	5	1	0	3	1.215
2	5	2	3	6	1	0	13	6.768
2	5	2	3	7	1	0	5	2.774
2	5	2	3	8	1	0	7	3.275
2	5	2	3	9	1	0	6	2.827
2	5	2	3	10	1	0	5	1.669
2	5	2	3	11	1	0	3	1.420
2	5	2	3	12	1	0	4	1.640
2	5	2	3	13	1	0	5	1.760
2	5	2	3	14	1	0	3	1.166
2	5	2	3	15	1	0	2	0.820
2	5	2	3	16	1	0	8	3.669
2	5	2	3	17	1	0	4	1.937
2	5	2	3	18	1	0	0	0.616
2	5	2	3	19	1	0	3	1.183

A	B	C	D	E	F	G	H	I
2	5	2	3	20	1	0	4	2.744
4	1	1	1	1	2	8	0	0.178
4	1	1	1	2	2	8	0	0.163
4	1	1	1	3	1	0	0	0.087
4	1	1	1	4	2	8	0	0.034
4	1	1	1	5	2	8	0	0.044
4	1	1	1	6	2	8	0	0.008
4	1	1	1	7	2	8	0	0.246
4	1	1	1	8	2	8	0	0.032
4	1	1	1	9	2	8	0	0.071
4	1	1	1	10	2	8	0	0.177
4	1	1	1	11	1	0	0	0.039
4	1	1	1	12	2	8	0	0.024
4	1	1	1	13	2	8	0	0.062
4	1	1	1	14	2	8	0	0.254
4	1	1	1	15	2	8	0	0.009
4	1	1	1	16	2	8	0	0.029
4	1	1	1	17	2	8	0	0.037
4	1	1	1	18	2	8	0	0.083
4	1	1	1	19	2	8	0	0.031
4	1	1	2	1	2	8	0	0.049
4	1	1	2	2	2	8	0	0.014
4	1	1	2	3	2	8	0	0.083
4	1	1	2	4	2	8	0	0.140
4	1	1	2	5	2	8	0	0.068
4	1	1	2	6	2	8	0	0.094
4	1	1	2	7	2	8	0	0.016
4	1	1	2	8	2	8	0	0.231
4	1	1	2	9	2	8	0	0.204
4	1	1	2	10	2	8	0	0.021
4	1	1	3	1	2	8	0	0.083
4	1	1	3	2	2	8	0	0.026
4	1	1	3	3	2	8	0	0.063
4	1	1	3	4	3	21	0	0.065
4	1	1	3	5	2	8	0	0.025
4	1	1	3	6	3	21	0	0.032
4	1	1	3	7	2	8	0	0.220
4	1	2	1	1	1	0	0	0.100
4	1	2	1	2	1	0	0	0.203
4	1	2	1	3	2	8	0	0.323
4	1	2	1	4	1	0	0	0.570
4	1	2	1	5	1	0	0	0.130
4	1	2	1	6	2	8	0	0.072
4	1	2	1	7	2	8	0	0.019
4	1	2	1	8	3	21	0	0.017
4	1	2	1	9	2	8	0	0.395
4	1	2	1	10	3	21	0	0.013
4	1	2	2	1	2	8	0	0.079
4	1	2	2	2	2	8	0	0.055
4	1	2	2	3	2	8	0	0.013
4	1	2	2	4	2	8	0	0.053
4	1	2	2	5	2	8	0	0.012
4	1	2	2	6	2	8	0	0.059
4	1	2	2	7	2	8	0	0.074
4	1	2	2	8	1	0	0	0.024
4	1	2	2	9	2	8	0	0.038
4	1	2	2	10	1	0	0	0.041
4	1	2	2	11	3	21	0	0.019
4	1	2	2	12	1	0	0	0.049
4	1	2	2	13	2	8	0	0.002
4	1	2	2	14	2	8	0	0.033
4	1	2	2	15	2	8	0	0.044
4	1	2	2	16	1	0	0	0.076
4	1	2	2	17	1	0	0	0.036
4	1	2	2	18	2	8	0	0.004
4	1	2	3	1	1	0	0	0.109
4	1	2	3	2	2	8	0	0.061
4	1	2	3	3	2	8	0	0.147
4	1	2	3	4	2	8	0	0.184
4	1	2	3	5	2	8	0	0.226
4	1	2	3	6	2	8	0	0.017
4	1	2	3	7	2	8	0	0.143
4	1	2	3	8	2	8	0	0.252
4	1	2	3	9	2	8	0	0.102
4	1	2	3	10	1	0	0	0.070
4	1	2	3	11	2	8	0	0.110
4	1	2	3	12	2	8	0	0.062
4	1	2	3	13	1	0	0	0.183
4	1	2	3	14	2	8	0	0.072
4	1	2	3	15	2	8	0	0.107
4	1	2	3	16	2	8	0	0.301
4	1	2	3	17	2	8	0	0.058
4	1	2	3	18	1	0	0	0.172
4	1	2	3	19	1	0	0	0.135
4	1	2	3	20	1	0	0	0.037
4	2	1	1	1	2	8	0	0.165
4	2	1	1	2	2	8	0	0.074
4	2	1	1	3	2	8	0	0.140
4	2	1	1	4	1	0	0	0.171
4	2	1	1	5	2	8	0	0.043
4	2	1	1	6	2	8	0	0.067
4	2	1	1	7	2	8	0	0.118
4	2	1	1	8	3	21	0	0.090
4	2	1	1	9	2	8	0	0.065
4	2	1	1	10	2	8	0	0.536
4	2	1	1	11	3	21	0	0.028
4	2	1	1	12	2	8	0	0.153
4	2	1	1	13	2	8	0	0.133
4	2	1	1	14	2	8	0	0.059
4	2	1	1	15	2	8	0	0.126
4	2	1	1	16	2	8	0	0.033
4	2	1	1	17	2	8	0	0.024
4	2	1	1	18	2	8	0	0.129
4	2	1	1	19	2	8	0	0.081
4	2	1	1	20	2	8	0	0.100
4	2	1	2	1	2	8	0	0.106
4	2	1	2	2	2	8	0	0.203
4	2	1	2	3	2	8	0	0.032
4	2	1	2	4	2	8	0	0.078
4	2	1	2	5	2	8	0	0.132
4	2	1	2	6	2	8	0	0.054
4	2	1	3	1	2	8	0	0.056
4	2	1	3	2	3	21	0	0.300
4	2	1	3	3	3	21	0	0.089
4	2	1	3	4	3	21	0	0.277
4	2	1	3	5	2	8	0	0.150
4	2	1	3	6	2	8	0	0.072
4	2	1	3	7	2	8	0	0.036
4	2	1	3	8	3	21	0	0.113
4	2	1	3	9	2	8	0	0.140
4	2	1	3	10	3	21	0	0.070
4	2	1	3	11	3	21	0	0.008
4	2	1	3	12	3	21	0	0.015
4	2	1	3	13	2	8	0	0.009
4	2	1	3	14	3	21	0	0.034
4	2	1	3	15	2	8	0	0.259
4	2	1	3	16	2	8	0	0.082
4	2	2	1	1	1	0	0	0.156
4	2	2	1	2	2	8	0	0.488
4	2	2	1	3	2	8	0	0.284
4	2	2	1	4	2	8	0	0.172
4	2	2	1	5	2	8	0	0.041

A	B	C	D	E	F	G	H	I
4	2	2	1	6	2	8	0	0.075
4	2	2	1	7	2	8	0	0.042
4	2	2	1	8	2	8	0	0.108
4	2	2	1	9	2	8	0	0.018
4	2	2	1	10	2	8	0	0.159
4	2	2	1	11	2	8	0	0.015
4	2	2	1	12	2	8	0	0.211
4	2	2	1	13	2	8	0	0.161
4	2	2	1	14	2	8	0	0.356
4	2	2	1	15	2	8	0	0.170
4	2	2	2	1	2	8	0	0.227
4	2	2	2	2	2	8	0	0.072
4	2	2	2	3	2	8	0	0.084
4	2	2	2	4	1	0	0	0.198
4	2	2	2	5	2	8	0	0.080
4	2	2	2	6	2	8	0	0.089
4	2	2	2	7	1	0	0	0.124
4	2	2	2	8	2	8	0	0.218
4	2	2	2	9	2	8	0	0.052
4	2	2	2	10	2	8	0	0.068
4	2	2	2	11	2	8	0	0.030
4	2	2	2	12	2	8	0	0.037
4	2	2	2	13	2	8	0	0.038
4	2	2	2	14	2	8	0	0.147
4	2	2	2	15	1	0	0	0.106
4	2	2	2	16	2	8	0	0.015
4	2	2	2	17	2	8	0	0.059
4	2	2	2	18	2	8	0	0.054
4	2	2	2	19	2	8	0	0.146
4	2	2	2	20	2	8	0	0.103
4	2	2	3	1	3	21	0	0.084
4	2	2	3	2	2	8	0	0.061
4	2	2	3	3	3	21	0	0.153
4	2	2	3	4	2	8	0	0.259
4	2	2	3	5	2	8	0	1.272
4	2	2	3	6	2	8	0	0.310
4	2	2	3	7	2	8	0	0.197
4	2	2	3	8	1	0	0	0.665
4	2	2	3	9	1	0	0	0.629
4	2	2	3	10	2	8	0	0.051
4	2	2	3	11	2	8	0	0.119
4	2	2	3	12	2	8	0	0.099
4	2	2	3	13	2	8	0	0.324
4	2	2	3	14	3	21	0	0.377
4	2	2	3	15	2	8	0	0.341
4	2	2	3	16	2	8	0	0.043
4	2	2	3	17	2	8	0	0.055
4	2	2	3	18	2	8	0	0.149
4	2	2	3	19	2	8	0	0.157
4	3	1	1	1	2	8	0	0.138
4	3	1	1	2	2	8	0	0.055
4	3	1	1	3	2	8	0	0.204
4	3	1	1	4	2	8	0	0.083
4	3	1	2	1	2	8	0	0.067
4	3	1	2	2	4	29	0	0.025
4	3	2	1	1	2	8	0	0.121
4	3	2	1	2	1	0	0	0.233
4	3	2	1	3	1	0	0	0.115
4	3	2	1	4	2	8	0	0.101
4	3	2	1	5	1	0	0	0.222
4	3	2	1	6	2	8	0	0.072
4	3	2	1	7	2	8	0	0.087
4	3	2	1	8	2	8	0	0.001
4	3	2	1	9	2	8	0	0.034
4	3	2	1	10	2	8	0	0.028
4	3	2	1	11	1	0	0	0.018

A	B	C	D	E	F	G	H	I
4	3	2	1	12	2	8	0	0.052
4	3	2	1	13	2	8	0	0.043
4	3	2	1	14	2	8	0	0.006
4	3	2	1	15	2	8	0	0.194
4	3	2	1	16	2	8	0	0.057
4	3	2	1	17	2	8	0	0.223
4	3	2	1	18	2	8	0	0.112
4	3	2	1	19	2	8	0	0.177
4	3	2	2	1	2	8	0	0.400
4	3	2	2	2	2	8	0	0.260
4	3	2	2	3	2	8	0	0.076
4	3	2	2	4	2	8	0	0.081
4	3	2	2	5	1	0	0	0.237
4	3	2	2	6	2	8	0	0.338
4	3	2	2	7	2	8	0	0.033
4	3	2	2	8	2	8	0	0.234
4	3	2	2	9	2	8	0	0.161
4	3	2	2	10	2	8	0	0.025
4	3	2	2	11	2	8	0	0.047
4	3	2	2	12	2	8	0	0.209
4	3	2	2	13	2	8	0	0.089
4	3	2	2	14	2	8	0	0.103
4	3	2	2	15	2	8	0	0.114
4	3	2	3	1	2	8	0	0.926
4	3	2	3	2	2	8	0	0.034
4	3	2	3	3	2	8	0	3.236
4	3	2	3	4	2	8	0	0.426
4	3	2	3	5	2	8	0	0.129
4	3	2	3	6	2	8	0	0.087
4	3	2	3	7	2	8	0	0.700
4	3	2	3	8	2	8	0	0.063
4	3	2	3	9	2	8	0	0.230
4	3	2	3	10	2	8	0	0.256
4	3	2	3	11	2	8	0	0.083
4	3	2	3	12	2	8	0	0.313
4	3	2	3	13	2	8	0	0.088
4	4	1	1	1	2	8	0	0.083
4	4	1	1	2	1	0	0	0.197
4	4	1	1	3	1	0	0	0.103
4	4	1	1	4	1	0	0	0.015
4	4	1	1	5	2	8	0	0.155
4	4	1	1	6	2	8	0	0.056
4	4	1	1	7	3	21	0	0.019
4	4	1	1	8	2	8	0	0.045
4	4	1	1	9	2	8	0	0.028
4	4	1	1	10	1	0	0	0.070
4	4	1	1	11	2	8	0	0.064
4	4	1	1	12	2	8	0	0.012
4	4	1	1	13	2	8	0	0.056
4	4	1	1	14	1	0	0	0.139
4	4	1	1	15	2	8	0	0.573
4	4	1	1	16	2	8	0	0.117
4	4	1	1	17	2	8	0	0.268
4	4	1	2	1	3	21	0	0.132
4	4	1	2	2	2	8	0	0.183
4	4	1	2	3	3	21	0	0.282
4	4	1	2	4	3	21	0	0.042
4	4	1	2	5	3	21	0	0.031
4	4	1	2	6	3	21	0	0.063
4	4	1	2	7	3	21	0	0.101
4	4	1	2	8	3	21	0	0.172
4	4	1	2	9	3	21	0	0.040
4	4	2	1	1	2	8	0	0.025
4	4	2	1	2	2	8	0	0.021
4	4	2	1	3	2	8	0	0.048
4	4	2	1	4	2	8	0	0.051

A	B	C	D	E	F	G	H	I
4	4	2	1	5	2	8	0	0.026
4	4	2	1	6	2	8	0	0.026
4	4	2	1	7	2	8	0	0.029
4	4	2	1	8	1	0	0	0.039
4	4	2	1	9	2	8	0	0.039
4	4	2	1	10	2	8	0	0.036
4	4	2	1	11	2	8	0	0.019
4	4	2	1	12	2	8	0	0.016
4	4	2	1	13	2	8	0	0.003
4	4	2	1	14	2	8	0	0.023
4	4	2	1	15	1	0	0	0.014
4	4	2	2	1	2	8	0	0.604
4	4	2	2	2	2	8	0	0.021
4	4	2	2	3	1	0	0	0.134
4	4	2	2	4	2	8	0	0.277
4	4	2	2	5	2	8	0	0.339
4	4	2	2	6	2	8	0	0.305
4	4	2	2	7	1	0	0	0.567
4	4	2	2	8	2	8	0	0.306
4	4	2	2	9	1	0	0	0.199
4	4	2	2	10	2	8	0	0.281
4	4	2	2	11	2	8	0	0.203
4	4	2	2	12	2	8	0	0.104
4	4	2	2	13	2	8	0	0.541
4	4	2	2	14	2	8	0	0.153
4	4	2	2	15	2	8	0	0.194
4	4	2	2	16	1	0	0	0.371
4	4	2	2	17	2	8	0	0.524
4	4	2	2	18	2	8	0	0.200
4	4	2	2	19	2	8	0	0.249
4	4	2	2	20	2	8	0	0.057
4	4	2	3	1	2	8	0	0.025
4	4	2	3	2	2	8	0	0.104
4	4	2	3	3	2	8	0	0.212
4	4	2	3	4	1	0	0	0.173
4	4	2	3	5	1	0	0	0.023
4	4	2	3	6	2	8	0	0.025
4	4	2	3	7	1	0	0	0.118
4	4	2	3	8	2	8	0	0.031
4	4	2	3	9	2	8	0	0.336
4	4	2	3	10	2	8	0	0.215
4	4	2	3	11	2	8	0	0.308
4	4	2	3	12	2	8	0	0.322
4	4	2	3	13	2	8	0	0.811
4	4	2	3	14	2	8	0	0.228
4	4	2	3	15	1	0	0	0.356
4	4	2	3	16	2	8	0	0.597
4	4	2	3	17	2	8	0	0.059
4	4	2	3	18	2	8	0	0.223
4	4	2	3	19	2	8	0	0.181
4	4	2	3	20	2	8	0	0.130
4	5	1	1	1	2	8	0	0.045
4	5	1	1	2	2	8	0	0.062
4	5	1	1	3	2	8	0	0.012
4	5	1	1	4	2	8	0	0.032
4	5	1	1	5	2	8	0	0.020
4	5	1	1	6	2	8	0	0.038
4	5	1	1	7	2	8	0	0.019
4	5	1	2	1	3	21	0	0.109
4	5	1	2	2	3	21	0	0.087
4	5	1	2	3	3	21	0	0.068
4	5	1	2	4	3	21	0	0.015
4	5	1	2	5	2	8	0	0.105
4	5	1	2	6	3	21	0	0.033
4	5	1	2	7	2	8	0	0.025
4	5	1	2	8	2	8	0	0.035

A	B	C	D	E	F	G	H	I
4	5	1	2	9	3	21	0	0.027
4	5	1	3	1	3	21	0	0.009
4	5	1	3	2	3	21	0	0.043
4	5	1	3	3	3	21	0	0.147
4	5	1	3	4	3	21	0	0.021
4	5	1	3	5	3	21	0	0.047
4	5	1	3	6	3	21	0	0.006
4	5	1	3	7	2	8	0	0.027
4	5	1	3	8	2	8	0	0.018
4	5	2	1	1	2	8	0	0.147
4	5	2	1	2	3	21	0	0.060
4	5	2	1	3	2	8	0	0.203
4	5	2	1	4	2	8	0	0.109
4	5	2	1	5	2	8	0	0.327
4	5	2	1	6	2	8	0	0.272
4	5	2	1	7	2	8	0	0.038
4	5	2	1	8	2	8	0	0.164
4	5	2	1	9	2	8	0	0.088
4	5	2	1	10	2	8	0	0.700
4	5	2	1	11	2	8	0	0.138
4	5	2	1	12	2	8	0	0.013
4	5	2	1	13	2	8	0	0.080
4	5	2	1	14	1	0	0	0.228
4	5	2	1	15	1	0	0	0.088
4	5	2	1	16	2	8	0	0.155
4	5	2	1	17	2	8	0	0.036
4	5	2	1	18	2	8	0	0.395
4	5	2	1	19	2	8	0	0.247
4	5	2	1	20	2	8	0	0.303
4	5	2	2	1	2	8	0	0.277
4	5	2	2	2	2	8	0	0.497
4	5	2	2	3	2	8	0	0.122
4	5	2	2	4	2	8	0	0.193
4	5	2	2	5	1	0	0	0.053
4	5	2	2	6	2	8	0	0.263
4	5	2	2	7	2	8	0	0.166
4	5	2	2	8	2	8	0	0.204
4	5	2	2	9	2	8	0	0.563
4	5	2	2	10	2	8	0	0.157
4	5	2	2	11	2	8	0	0.035
4	5	2	2	12	2	8	0	0.014
4	5	2	2	13	2	8	0	0.019
4	5	2	2	14	2	8	0	0.114
4	5	2	2	15	2	8	0	0.084
4	5	2	2	16	1	0	0	0.007
4	5	2	2	17	2	8	0	0.098
4	5	2	2	18	2	8	0	0.121
4	5	2	2	19	1	0	0	0.146
4	5	2	2	20	2	8	0	0.044
4	5	2	3	1	2	8	0	0.094
4	5	2	3	2	2	8	0	0.025
4	5	2	3	3	2	8	0	0.095
4	5	2	3	4	2	8	0	0.096
4	5	2	3	5	2	8	0	0.202
4	5	2	3	6	2	8	0	0.015
4	5	2	3	7	2	8	0	0.037
4	5	2	3	8	2	8	0	0.146
4	5	2	3	9	2	8	0	0.178
4	5	2	3	10	2	8	0	0.194
4	5	2	3	11	2	8	0	0.151
4	5	2	3	12	2	8	0	0.011
4	5	2	3	13	2	8	0	0.045
4	5	2	3	14	2	8	0	0.112
4	5	2	3	15	2	8	0	0.136
4	5	2	3	16	2	8	0	0.057
4	5	2	3	17	2	8	0	0.057

A	B	C	D	E	F	G	H	I
4	5	2	3	18	2	8	0	0.147
4	5	2	3	19	2	8	0	0.087
4	5	2	3	20	2	8	0	0.162
5	1	1	1	1	1	0	32	7.654
5	1	1	1	2	3	21	12	3.317
5	1	1	1	3	3	21	13	2.441
5	1	1	1	4	3	21	17	3.054
5	1	1	1	5	3	21	8	1.666
5	1	1	1	6	3	21	17	3.199
5	1	1	1	7	9	107	0	0.011
5	1	1	1	8	9	107	0	0.003
5	1	1	1	9	9	107	0	0.005
5	1	1	1	10	9	107	0	0.004
5	1	1	1	11	9	107	0	0.008
5	1	1	1	12	9	107	0	0.011
5	1	1	1	13	9	107	0	0.003
5	1	1	1	14	9	107	0	0.004
5	1	1	1	15	9	107	0	0.005
5	1	1	1	16	9	107	0	0.006
5	1	1	1	17	9	107	0	0.003
5	1	1	1	18	9	107	0	0.014
5	1	1	1	19	9	107	0	0.003
5	1	1	1	20	9	107	0	0.011
5	1	1	2	1	3	21	8	1.523
5	1	1	2	2	3	21	4	0.764
5	1	1	2	3	3	21	5	1.123
5	1	1	2	4	3	21	4	0.550
5	1	1	2	5	5	43	1	0.154
5	1	1	2	6	1	0	4	0.506
5	1	1	2	7	3	21	6	0.656
5	1	1	2	8	1	0	11	1.546
5	1	1	2	9	1	0	13	2.486
5	1	1	2	10	3	21	6	0.695
5	1	1	2	11	9	107	0	0.004
5	1	1	2	12	9	107	0	0.002
5	1	1	2	13	9	107	0	0.001
5	1	1	2	14	9	107	0	0.001
5	1	1	2	15	9	107	0	0.006
5	1	1	3	1	4	29	6	1.358
5	1	1	3	2	2	8	5	0.575
5	1	1	3	3	3	21	14	2.662
5	1	1	3	4	3	21	6	1.128
5	1	1	3	5	3	21	11	1.174
5	1	1	3	6	3	21	7	0.903
5	1	1	3	7	3	21	10	1.824
5	1	1	3	8	8	90	0	0.018
5	1	1	3	9	9	107	0	0.004
5	1	1	3	10	9	107	0	0.007
5	1	1	3	11	9	107	0	0.007
5	1	1	3	12	9	107	0	0.004
5	1	1	3	13	9	107	0	0.003
5	1	1	3	14	9	107	0	0.009
5	1	1	3	15	9	107	0	0.004
5	1	1	3	16	9	107	0	0.008
5	1	1	3	17	9	107	0	0.010
5	1	2	1	1	3	21	26	4.321
5	1	2	1	2	3	21	6	1.389
5	1	2	1	3	1	0	11	3.564
5	1	2	1	4	3	21	14	2.083
5	1	2	1	5	4	29	8	1.042
5	1	2	1	6	3	21	15	1.563
5	1	2	1	7	2	8	14	2.507
5	1	2	1	8	4	29	2	0.392
5	1	2	1	9	3	21	3	0.166
5	1	2	1	10	2	8	7	1.032
5	1	2	1	11	3	21	18	2.414

A	B	C	D	E	F	G	H	I
5	1	2	1	12	9	107	0	0.002
5	1	2	1	13	9	107	0	0.010
5	1	2	1	14	9	107	0	0.001
5	1	2	1	15	9	107	0	0.011
5	1	2	1	16	9	107	0	0.002
5	1	2	1	17	9	107	0	0.003
5	1	2	2	1	5	43	15	2.105
5	1	2	2	2	1	0	33	5.724
5	1	2	2	3	3	21	5	0.202
5	1	2	2	4	1	0	15	1.947
5	1	2	2	5	1	0	7	1.129
5	1	2	2	6	3	21	11	1.856
5	1	2	2	7	1	0	12	1.936
5	1	2	2	8	1	0	3	0.397
5	1	2	2	9	9	107	0	0.002
5	1	2	2	10	9	107	0	0.008
5	1	2	2	11	9	107	0	0.004
5	1	2	2	12	9	107	0	0.004
5	1	2	2	13	9	107	0	0.004
5	1	2	2	14	9	107	0	0.005
5	1	2	2	15	9	107	0	0.003
5	1	2	2	16	9	107	0	0.006
5	1	2	2	17	9	107	0	0.003
5	1	2	3	1	3	21	7	2.158
5	1	2	3	2	1	0	0	0.137
5	1	2	3	3	4	29	1	0.495
5	1	2	3	4	1	0	4	1.397
5	1	2	3	5	1	0	5	1.234
5	1	2	3	6	1	0	9	2.065
5	1	2	3	7	2	8	6	1.614
5	1	2	3	8	4	29	3	0.789
5	1	2	3	9	9	107	0	0.012
5	1	2	3	10	9	107	0	0.001
5	1	2	3	11	9	107	0	0.015
5	1	2	3	12	9	107	0	0.003
5	1	2	3	13	9	107	0	0.001
5	1	2	3	14	9	107	0	0.002
5	2	1	1	1	3	21	6	1.305
5	2	1	1	2	3	21	3	0.399
5	2	1	1	3	1	0	11	2.336
5	2	1	1	4	3	21	1	0.342
5	2	1	1	5	3	21	0	0.155
5	2	1	1	6	1	0	4	0.809
5	2	1	1	7	4	29	0	0.072
5	2	1	1	8	9	107	0	0.020
5	2	1	1	9	9	107	0	0.010
5	2	1	1	10	9	107	0	0.012
5	2	1	1	11	9	107	0	0.010
5	2	1	1	12	9	107	0	0.026
5	2	1	1	13	9	107	0	0.046
5	2	1	1	14	9	107	0	0.037
5	2	1	1	15	9	107	0	0.016
5	2	1	1	16	9	107	0	0.005
5	2	1	1	17	9	107	0	0.004
5	2	1	1	18	9	107	0	0.018
5	2	1	1	19	9	107	0	0.010
5	2	1	1	20	9	107	0	0.013
5	2	1	2	1	3	21	2	0.554
5	2	1	2	2	1	0	2	0.343
5	2	1	2	3	1	0	6	1.261
5	2	1	2	4	3	21	2	0.326
5	2	1	2	5	3	21	2	0.519
5	2	1	2	6	3	21	3	0.953
5	2	1	2	7	3	21	7	1.499
5	2	1	2	8	1	0	2	0.234
5	2	1	2	9	1	0	1	0.282

A	B	C	D	E	F	G	H	I
5	2	1	2	10	3	21	4	0.931
5	2	1	2	11	9	107	0	0.006
5	2	1	2	12	9	107	0	0.008
5	2	1	2	13	9	107	0	0.005
5	2	1	2	14	9	107	0	0.012
5	2	1	2	15	9	107	0	0.013
5	2	1	2	16	9	107	0	0.013
5	2	1	2	17	9	107	0	0.005
5	2	1	2	18	9	107	0	0.007
5	2	1	2	19	9	107	0	0.006
5	2	1	2	20	9	107	0	0.008
5	2	1	3	1	1	0	15	2.281
5	2	1	3	2	8	90	0	0.048
5	2	1	3	3	9	107	0	0.007
5	2	1	3	4	9	107	0	0.002
5	2	1	3	5	9	107	0	0.004
5	2	1	3	6	9	107	0	0.003
5	2	1	3	7	9	107	0	0.009
5	2	1	3	8	9	107	0	0.002
5	2	1	3	9	9	107	0	0.008
5	2	1	3	10	9	107	0	0.005
5	2	1	3	11	9	107	0	0.013
5	2	1	3	12	9	107	0	0.009
5	2	1	3	13	9	107	0	0.003
5	2	1	3	14	9	107	0	0.018
5	2	1	3	15	9	107	0	0.039
5	2	1	3	16	9	107	0	0.007
5	2	1	3	17	9	107	0	0.007
5	2	1	3	18	9	107	0	0.010
5	2	1	3	19	9	107	0	0.003
5	2	1	3	20	9	107	0	0.018
5	2	2	1	1	3	21	17	2.514
5	2	2	1	2	3	21	23	3.537
5	2	2	1	3	1	0	37	9.176
5	2	2	1	4	9	107	0	0.007
5	2	2	1	5	9	107	0	0.004
5	2	2	1	6	9	107	0	0.001
5	2	2	1	7	9	107	0	0.004
5	2	2	1	8	9	107	0	0.002
5	2	2	1	9	9	107	0	0.002
5	2	2	1	10	9	107	0	0.003
5	2	2	1	11	9	107	0	0.005
5	2	2	2	1	1	0	31	7.635
5	2	2	2	2	3	21	19	3.391
5	2	2	2	3	4	29	8	1.323
5	2	2	2	4	3	21	4	0.677
5	2	2	2	5	9	107	0	0.012
5	2	2	2	6	9	107	0	0.006
5	2	2	2	7	9	107	0	0.010
5	2	2	2	8	9	107	0	0.006
5	2	2	2	9	9	107	0	0.007
5	2	2	2	10	9	107	0	0.009
5	2	2	2	11	9	107	0	0.009
5	2	2	2	12	9	107	0	0.020
5	2	2	2	13	9	107	0	0.019
5	2	2	2	14	9	107	0	0.015
5	2	2	2	15	9	107	0	0.008
5	2	2	2	16	9	107	0	0.009
5	2	2	3	1	3	21	4	1.074
5	2	2	3	2	3	21	7	1.390
5	2	2	3	3	3	21	10	1.658
5	2	2	3	4	3	21	6	1.302
5	2	2	3	5	3	21	4	0.257
5	2	2	3	6	3	21	2	0.479
5	2	2	3	7	9	107	0	0.004
5	2	2	3	8	9	107	0	0.003
5	2	2	3	9	9	107	0	0.002
5	2	2	3	10	9	107	0	0.003
5	2	2	3	11	9	107	0	0.006
5	2	2	3	12	9	107	0	0.004
5	2	2	3	13	9	107	0	0.001
5	2	2	3	14	9	107	0	0.004
5	2	2	3	15	9	107	0	0.004
5	2	2	3	16	9	107	0	0.003
5	2	2	3	17	9	107	0	0.003
5	2	2	3	18	9	107	0	0.003
5	3	1	1	1	2	8	1	0.367
5	3	1	1	2	3	21	3	0.805
5	3	1	1	3	9	107	0	0.106
5	3	1	1	4	9	107	0	0.104
5	3	1	1	5	9	107	0	0.072
5	3	1	1	6	9	107	0	0.070
5	3	1	1	7	9	107	0	0.044
5	3	1	1	8	9	107	0	0.029
5	3	1	1	9	9	107	0	0.013
5	3	1	1	10	9	107	0	0.014
5	3	1	1	11	9	107	0	0.015
5	3	1	1	12	9	107	0	0.061
5	3	1	1	13	9	107	0	0.070
5	3	1	1	14	9	107	0	0.057
5	3	1	1	15	9	107	0	0.086
5	3	1	1	16	9	107	0	0.126
5	3	1	1	17	9	107	0	0.067
5	3	1	1	18	9	107	0	0.119
5	3	1	1	19	9	107	0	0.126
5	3	1	1	20	9	107	0	0.068
5	3	1	2	1	3	21	10	4.708
5	3	1	2	2	3	21	0	0.184
5	3	1	2	3	3	21	12	4.260
5	3	1	2	4	3	21	2	0.550
5	3	1	2	5	4	29	3	1.795
5	3	1	2	6	3	21	8	3.002
5	3	1	2	7	5	43	0	0.245
5	3	1	2	8	9	107	0	0.001
5	3	1	2	9	9	107	0	0.017
5	3	1	2	10	9	107	0	0.016
5	3	1	2	11	9	107	0	0.015
5	3	1	2	12	9	107	0	0.002
5	3	1	2	13	9	107	0	0.018
5	3	1	2	14	9	107	0	0.021
5	3	1	2	15	9	107	0	0.004
5	3	1	2	16	9	107	0	0.013
5	3	1	2	17	9	107	0	0.006
5	3	1	2	18	9	107	0	0.007
5	3	1	2	19	9	107	0	0.001
5	3	1	2	20	9	107	0	0.004
5	3	1	3	1	5	43	0	0.659
5	3	1	3	2	1	0	6	4.862
5	3	1	3	3	5	43	2	0.613
5	3	1	3	4	3	21	7	3.048
5	3	1	3	5	3	21	9	4.197
5	3	1	3	6	1	0	7	1.435
5	3	1	3	7	3	21	27	7.691
5	3	1	3	8	8	90	0	0.018
5	3	1	3	9	9	107	0	0.002
5	3	1	3	10	9	107	0	0.011
5	3	1	3	11	9	107	0	0.017
5	3	1	3	12	9	107	0	0.010
5	3	1	3	13	9	107	0	0.017
5	3	1	3	14	9	107	0	0.014
5	3	1	3	15	9	107	0	0.002
5	3	1	3	16	9	107	0	0.006

A	B	C	D	E	F	G	H	I
5	3	1	3	17	9	107	0	0.003
5	3	1	3	18	9	107	0	0.005
5	3	1	3	19	9	107	0	0.016
5	3	1	3	20	9	107	0	0.017
5	3	2	1	1	3	21	2	0.394
5	3	2	1	2	2	8	2	0.350
5	3	2	1	3	4	29	2	0.145
5	3	2	1	4	3	21	3	0.327
5	3	2	1	5	3	21	2	0.252
5	3	2	1	6	1	0	11	1.826
5	3	2	1	7	4	29	2	0.194
5	3	2	1	8	3	21	3	0.319
5	3	2	1	9	3	21	5	0.475
5	3	2	1	10	2	8	11	1.464
5	3	2	1	11	2	8	3	0.318
5	3	2	1	12	3	21	2	0.241
5	3	2	1	13	3	21	4	0.561
5	3	2	1	14	3	21	7	0.753
5	3	2	1	15	9	107	0	0.008
5	3	2	1	16	9	107	0	0.004
5	3	2	2	1	3	21	20	3.712
5	3	2	2	2	3	21	22	3.356
5	3	2	2	3	3	21	19	3.999
5	3	2	2	4	2	8	29	6.813
5	3	2	2	5	3	21	66	15.370
5	3	2	2	6	9	107	0	0.007
5	3	2	2	7	9	107	0	0.003
5	3	2	2	8	9	107	0	0.009
5	3	2	2	9	9	107	0	0.007
5	3	2	2	10	9	107	0	0.006
5	3	2	2	11	9	107	0	0.001
5	3	2	2	12	9	107	0	0.008
5	3	2	2	13	9	107	0	0.003
5	3	2	3	1	3	21	7	1.491
5	3	2	3	2	3	21	3	0.380
5	3	2	3	3	4	29	0	0.097
5	3	2	3	4	4	29	0	0.024
5	3	2	3	5	3	21	5	1.381
5	3	2	3	6	3	21	6	1.186
5	3	2	3	7	3	21	3	0.422
5	3	2	3	8	3	21	12	2.714
5	3	2	3	9	3	21	8	1.676
5	3	2	3	10	2	8	11	2.201
5	3	2	3	11	2	8	10	2.539
5	3	2	3	12	3	21	6	1.906
5	3	2	3	13	1	0	10	3.221
5	3	2	3	14	1	0	9	2.214
5	3	2	3	15	3	21	3	1.146
5	3	2	3	16	9	107	0	0.006
5	3	2	3	17	9	107	0	0.005
5	3	2	3	18	9	107	0	0.005
5	3	2	3	19	9	107	0	0.004
5	3	2	3	20	9	107	0	0.004
5	4	1	1	1	3	21	11	1.867
5	4	1	1	2	5	43	1	0.290
5	4	1	1	3	5	43	2	0.304
5	4	1	1	4	3	21	17	4.482
5	4	1	1	5	3	21	14	2.050
5	4	1	1	6	3	21	8	1.087
5	4	1	1	7	3	21	14	2.670
5	4	1	1	8	1	0	18	2.018
5	4	1	1	9	9	107	0	0.033
5	4	1	1	10	9	107	0	0.024
5	4	1	1	11	9	107	0	0.030
5	4	1	1	12	9	107	0	0.010
5	4	1	1	13	9	107	0	0.008
5	4	1	1	14	9	107	0	0.004
5	4	1	1	15	9	107	0	0.002
5	4	1	1	16	9	107	0	0.005
5	4	1	1	17	9	107	0	0.002
5	4	1	1	18	9	107	0	0.007
5	4	1	1	19	9	107	0	0.009
5	4	1	1	20	9	107	0	0.019
5	4	1	2	1	3	21	7	1.694
5	4	1	2	2	3	21	2	0.322
5	4	1	2	3	3	21	3	0.459
5	4	1	2	4	3	21	1	0.644
5	4	1	2	5	3	21	6	1.415
5	4	1	2	6	4	29	2	0.338
5	4	1	2	7	3	21	8	2.315
5	4	1	2	8	3	21	2	0.585
5	4	1	2	9	3	21	10	1.280
5	4	1	2	10	3	21	4	0.816
5	4	1	2	11	4	29	0	0.149
5	4	1	2	12	3	21	6	0.883
5	4	1	2	13	3	21	5	0.793
5	4	1	2	14	3	21	1	0.546
5	4	1	2	15	3	21	1	0.290
5	4	1	2	16	9	107	0	0.044
5	4	1	2	17	9	107	0	0.039
5	4	1	2	18	9	107	0	0.036
5	4	1	2	19	9	107	0	0.043
5	4	1	2	20	9	107	0	0.045
5	4	1	3	1	3	21	5	1.756
5	4	1	3	2	3	21	3	0.429
5	4	1	3	3	4	29	5	0.826
5	4	1	3	4	1	0	14	2.589
5	4	1	3	5	1	0	2	0.356
5	4	1	3	6	5	43	0	0.010
5	4	1	3	7	3	21	5	0.780
5	4	1	3	8	4	29	1	0.099
5	4	1	3	9	3	21	6	0.919
5	4	1	3	10	3	21	7	1.340
5	4	1	3	11	3	21	9	1.614
5	4	1	3	12	3	21	1	0.270
5	4	1	3	13	4	29	1	1.097
5	4	1	3	14	9	107	0	0.005
5	4	1	3	15	9	107	0	0.004
5	4	1	3	16	9	107	0	0.002
5	4	1	3	17	9	107	0	0.004
5	4	1	3	18	9	107	0	0.005
5	4	1	3	19	9	107	0	0.003
5	4	1	3	20	9	107	0	0.004
5	4	2	1	1	3	21	11	1.102
5	4	2	1	2	3	21	12	1.192
5	4	2	1	3	1	0	11	1.639
5	4	2	1	4	1	0	17	2.182
5	4	2	1	5	5	43	3	0.376
5	4	2	1	6	1	0	7	0.790
5	4	2	1	7	3	21	11	0.881
5	4	2	1	8	3	21	5	0.738
5	4	2	1	9	9	107	0	0.001
5	4	2	1	10	9	107	0	0.002
5	4	2	1	11	9	107	0	0.002
5	4	2	1	12	9	107	0	0.003
5	4	2	1	13	9	107	0	0.004
5	4	2	2	1	3	21	1	0.495
5	4	2	2	2	3	21	7	1.672
5	4	2	2	3	5	43	1	0.158
5	4	2	2	4	3	21	6	1.162
5	4	2	2	5	4	29	1	0.099
5	4	2	2	6	4	29	0	0.253

A	B	C	D	E	F	G	H	I
5	4	2	2	7	9	107	0	0.001
5	4	2	2	8	9	107	0	0.004
5	4	2	2	9	9	107	0	0.001
5	4	2	2	10	9	107	0	0.004
5	4	2	2	11	9	107	0	0.003
5	4	2	3	1	3	21	5	0.583
5	4	2	3	2	3	21	4	0.529
5	4	2	3	3	3	21	9	1.265
5	4	2	3	4	3	21	5	1.422
5	4	2	3	5	4	29	1	0.292
5	4	2	3	6	3	21	3	0.520
5	4	2	3	7	4	29	1	0.318
5	4	2	3	8	1	0	15	1.887
5	4	2	3	9	5	43	0	0.037
5	4	2	3	10	9	107	0	0.005
5	4	2	3	11	9	107	0	0.009
5	4	2	3	12	9	107	0	0.002
5	4	2	3	13	9	107	0	0.002
5	4	2	3	14	9	107	0	0.003
5	4	2	3	15	9	107	0	0.009
5	4	2	3	16	9	107	0	0.001
5	4	2	3	17	9	107	0	0.001
5	4	2	3	18	9	107	0	0.003
5	4	2	3	19	9	107	0	0.002
5	4	2	3	20	9	107	0	0.004
5	5	1	1	1	4	29	0	0.261
5	5	1	1	2	2	8	6	0.907
5	5	1	1	3	3	21	3	0.581
5	5	1	1	4	3	21	6	0.841
5	5	1	1	5	3	21	7	1.203
5	5	1	1	6	3	21	7	1.178
5	5	1	1	7	3	21	2	0.359
5	5	1	1	8	4	29	0	0.111
5	5	1	1	9	5	43	1	0.085
5	5	1	1	10	8	90	0	0.042
5	5	1	1	11	3	21	0	0.010
5	5	1	1	12	9	107	0	0.066
5	5	1	1	13	9	107	0	0.042
5	5	1	1	14	9	107	0	0.036
5	5	1	1	15	9	107	0	0.019
5	5	1	1	16	9	107	0	0.005
5	5	1	1	17	9	107	0	0.012
5	5	1	1	18	9	107	0	0.016
5	5	1	1	19	9	107	0	0.028
5	5	1	1	20	9	107	0	0.039
5	5	1	2	1	3	21	3	0.378
5	5	1	2	2	3	21	0	0.061
5	5	1	2	3	3	21	1	0.262
5	5	1	2	4	3	21	0	0.152
5	5	1	2	5	3	21	1	0.166
5	5	1	2	6	8	90	0	0.027
5	5	1	2	7	3	21	1	0.114
5	5	1	2	8	3	21	1	0.360
5	5	1	2	9	3	21	0	0.171
5	5	1	2	10	3	21	3	0.617
5	5	1	2	11	3	21	0	0.100
5	5	1	2	12	3	21	0	0.088
5	5	1	2	13	3	21	0	0.092
5	5	1	2	14	3	21	0	0.262
5	5	1	2	15	4	29	1	0.086
5	5	1	2	16	4	29	0	0.039
5	5	1	2	17	3	21	0	0.101
5	5	1	2	18	3	21	4	0.669
5	5	1	2	19	9	107	0	0.011
5	5	1	2	20	9	107	0	0.014
5	5	1	3	1	4	29	1	0.067
5	5	1	3	2	3	21	1	0.284
5	5	1	3	3	5	43	0	0.017
5	5	1	3	4	3	21	1	0.079
5	5	1	3	5	3	21	2	0.066
5	5	1	3	6	2	8	1	0.071
5	5	1	3	7	3	21	0	0.017
5	5	1	3	8	6	51	0	0.058
5	5	1	3	9	3	21	0	0.197
5	5	1	3	10	3	21	4	0.406
5	5	1	3	11	5	43	0	0.015
5	5	1	3	12	4	29	0	0.022
5	5	1	3	13	9	107	0	0.077
5	5	1	3	14	9	107	0	0.006
5	5	1	3	15	9	107	0	0.005
5	5	1	3	16	9	107	0	0.008
5	5	1	3	17	9	107	0	0.013
5	5	1	3	18	9	107	0	0.010
5	5	1	3	19	9	107	0	0.005
5	5	1	3	20	9	107	0	0.008
5	5	2	1	1	1	0	11	2.110
5	5	2	1	2	3	21	3	0.722
5	5	2	1	3	3	21	2	0.432
5	5	2	1	4	2	8	1	0.954
5	5	2	1	5	3	21	2	0.247
5	5	2	1	6	3	21	0	0.202
5	5	2	1	7	3	21	0	0.423
5	5	2	1	8	3	21	0	0.041
5	5	2	1	9	3	21	2	0.310
5	5	2	1	10	2	8	6	0.986
5	5	2	1	11	3	21	0	0.312
5	5	2	1	12	3	21	0	0.154
5	5	2	1	13	2	8	1	0.410
5	5	2	1	14	3	21	0	0.082
5	5	2	1	15	3	21	0	0.094
5	5	2	1	16	2	8	2	0.299
5	5	2	1	17	1	0	2	0.365
5	5	2	1	18	2	8	0	0.114
5	5	2	1	19	3	21	0	0.111
5	5	2	1	20	3	21	1	0.160
5	5	2	2	1	3	21	1	0.268
5	5	2	2	2	2	8	5	1.021
5	5	2	2	3	3	21	4	0.625
5	5	2	2	4	2	8	7	1.116
5	5	2	2	5	3	21	5	1.066
5	5	2	2	6	4	29	0	0.143
5	5	2	2	7	4	29	0	0.062
5	5	2	2	8	4	29	0	0.087
5	5	2	2	9	1	0	6	2.048
5	5	2	2	10	5	43	0	0.387
5	5	2	2	11	5	43	2	0.553
5	5	2	2	12	3	21	3	0.681
5	5	2	2	13	2	8	5	1.062
5	5	2	2	14	9	107	0	0.006
5	5	2	2	15	9	107	0	0.004
5	5	2	2	16	9	107	0	0.005
5	5	2	2	17	9	107	0	0.003
5	5	2	2	18	9	107	0	0.004
5	5	2	2	19	9	107	0	0.004
5	5	2	2	20	9	107	0	0.003
5	5	2	3	1	1	0	9	1.129
5	5	2	3	2	3	21	2	0.341
5	5	2	3	3	3	21	0	0.080
5	5	2	3	4	2	8	2	0.184
5	5	2	3	5	1	0	1	0.216
5	5	2	3	6	1	0	6	0.788
5	5	2	3	7	1	0	5	0.589

A	B	C	D	E	F	G	H	I
5	5	2	3	8	3	21	1	0.237
5	5	2	3	9	3	21	1	0.248
5	5	2	3	10	4	29	0	0.075
5	5	2	3	11	3	21	0	0.188
5	5	2	3	12	2	8	0	0.161
5	5	2	3	13	1	0	2	0.180
5	5	2	3	14	3	21	0	0.136
5	5	2	3	15	3	21	2	0.227
5	5	2	3	16	1	0	1	0.146
5	5	2	3	17	3	21	0	0.133
5	5	2	3	18	9	107	0	0.001
5	5	2	3	19	9	107	0	0.003
5	5	2	3	20	9	107	0	0.004
6	1	1	1	1	1	0	23	7.694
6	1	1	1	2	1	0	22	7.813
6	1	1	1	3	3	21	6	1.401
6	1	1	1	4	3	21	11	1.415
6	1	1	1	5	3	21	6	0.875
6	1	1	1	6	3	21	12	2.213
6	1	1	1	7	1	0	21	4.465
6	1	1	1	8	1	0	14	3.812
6	1	1	1	9	3	21	8	0.912
6	1	1	1	10	3	21	1	0.179
6	1	1	1	11	3	21	6	1.637
6	1	1	1	12	3	21	1	0.283
6	1	1	1	13	3	21	4	0.521
6	1	1	1	14	3	21	1	0.187
6	1	1	1	15	3	21	5	0.876
6	1	1	1	16	9	107	0	0.057
6	1	1	2	1	3	21	11	1.866
6	1	1	2	2	3	21	3	0.439
6	1	1	2	3	2	8	10	1.488
6	1	1	2	4	3	21	11	1.820
6	1	1	2	5	3	21	5	0.880
6	1	1	2	6	3	21	5	0.558
6	1	1	2	7	3	21	8	1.466
6	1	1	2	8	3	21	4	0.554
6	1	1	2	9	4	29	4	0.363
6	1	1	2	10	5	43	0	0.006
6	1	1	2	11	3	21	3	0.628
6	1	1	2	12	3	21	3	0.341
6	1	1	2	13	1	0	10	2.787
6	1	1	2	14	2	8	10	1.788
6	1	1	2	15	2	8	5	0.834
6	1	1	2	16	1	0	10	2.521
6	1	1	2	17	1	0	20	3.800
6	1	1	2	18	1	0	10	3.047
6	1	1	2	19	3	21	6	1.772
6	1	1	2	20	3	21	10	1.248
6	1	1	3	1	1	0	8	2.082
6	1	1	3	2	4	29	0	0.050
6	1	1	3	3	3	21	8	1.277
6	1	1	3	4	3	21	7	2.216
6	1	1	3	5	3	21	0	0.169
6	1	1	3	6	3	21	4	0.912
6	1	1	3	7	1	0	18	4.143
6	1	1	3	8	1	0	11	2.714
6	1	1	3	9	1	0	18	4.852
6	1	1	3	10	2	8	12	2.700
6	1	1	3	11	3	21	5	2.424
6	1	1	3	12	9	107	0	0.048
6	1	1	3	13	3	21	9	1.499
6	1	1	3	14	3	21	6	1.061
6	1	1	3	15	3	21	4	1.154
6	1	1	3	16	9	107	0	0.005
6	1	1	3	17	3	21	10	2.436

A	B	C	D	E	F	G	H	I
6	1	1	3	18	1	0	14	4.974
6	1	1	3	19	1	0	26	9.636
6	1	1	3	20	4	29	1	0.421
6	1	2	1	1	2	8	9	2.123
6	1	2	1	2	2	8	9	1.997
6	1	2	1	3	1	0	5	0.990
6	1	2	1	4	2	8	8	1.690
6	1	2	1	5	2	8	6	1.052
6	1	2	1	6	1	0	1	0.506
6	1	2	1	7	2	8	15	2.363
6	1	2	1	8	2	8	12	2.110
6	1	2	1	9	3	21	1	0.275
6	1	2	1	10	1	0	6	1.515
6	1	2	1	11	2	8	0	0.195
6	1	2	1	12	1	0	9	1.385
6	1	2	1	13	2	8	5	1.064
6	1	2	1	14	1	0	5	1.014
6	1	2	1	15	2	8	4	1.002
6	1	2	1	16	3	21	1	0.335
6	1	2	1	17	2	8	4	0.878
6	1	2	1	18	2	8	6	0.948
6	1	2	1	19	1	0	18	5.169
6	1	2	1	20	2	8	7	1.664
6	1	2	2	1	3	21	5	0.935
6	1	2	2	2	1	0	6	1.021
6	1	2	2	3	1	0	13	3.425
6	1	2	2	4	1	0	11	2.243
6	1	2	2	5	1	0	4	0.665
6	1	2	2	6	1	0	19	5.158
6	1	2	2	7	1	0	10	2.896
6	1	2	2	8	3	21	8	1.527
6	1	2	2	9	1	0	13	3.271
6	1	2	2	10	3	21	2	0.366
6	1	2	2	11	1	0	9	1.928
6	1	2	2	12	1	0	18	3.179
6	1	2	2	13	1	0	6	1.805
6	1	2	2	14	1	0	4	1.023
6	1	2	2	15	2	8	14	2.953
6	1	2	2	16	1	0	13	2.454
6	1	2	2	17	3	21	6	1.071
6	1	2	2	18	1	0	3	1.061
6	1	2	2	19	1	0	16	3.343
6	1	2	2	20	2	8	5	1.504
6	1	2	3	1	3	21	5	1.000
6	1	2	3	2	2	8	18	3.725
6	1	2	3	3	2	8	9	1.918
6	1	2	3	4	2	8	13	2.782
6	1	2	3	5	2	8	14	2.698
6	1	2	3	6	2	8	9	2.188
6	1	2	3	7	1	0	3	0.688
6	1	2	3	8	4	29	2	0.301
6	1	2	3	9	3	21	9	1.636
6	1	2	3	10	1	0	32	6.040
6	1	2	3	11	1	0	13	2.176
6	1	2	3	12	2	8	6	1.238
6	1	2	3	13	3	21	4	0.735
6	1	2	3	14	2	8	18	3.075
6	1	2	3	15	2	8	10	1.650
6	1	2	3	16	2	8	7	1.212
6	1	2	3	17	2	8	12	2.394
6	1	2	3	18	2	8	6	1.413
6	1	2	3	19	2	8	10	1.579
6	1	2	3	20	3	21	0	0.053
6	2	1	1	1	3	21	3	0.482
6	2	1	1	2	1	0	11	3.052
6	2	1	1	3	1	0	5	0.879

A	B	C	D	E	F	G	H	I
6	2	1	1	4	1	0	4	1.036
6	2	1	1	5	3	21	2	0.418
6	2	1	1	6	1	0	8	1.620
6	2	1	1	7	1	0	6	2.545
6	2	1	1	8	1	0	19	4.267
6	2	1	1	9	1	0	12	2.685
6	2	1	1	10	3	21	1	0.385
6	2	1	1	11	3	21	4	0.790
6	2	1	1	12	3	21	10	2.865
6	2	1	1	13	3	21	7	1.857
6	2	1	1	14	3	21	1	0.228
6	2	1	1	15	3	21	1	0.255
6	2	1	1	16	3	21	1	0.202
6	2	1	1	17	1	0	0	0.832
6	2	1	1	18	1	0	5	0.946
6	2	1	1	19	3	21	1	0.287
6	2	1	1	20	3	21	2	0.485
6	2	1	2	1	3	21	5	1.063
6	2	1	2	2	3	21	1	0.291
6	2	1	2	3	3	21	7	1.150
6	2	1	2	4	3	21	13	2.518
6	2	1	2	5	3	21	5	1.218
6	2	1	2	6	4	29	2	0.399
6	2	1	2	7	3	21	5	1.205
6	2	1	2	8	3	21	10	2.342
6	2	1	2	9	3	21	12	2.821
6	2	1	2	10	3	21	13	2.804
6	2	1	2	11	3	21	12	1.672
6	2	1	2	12	3	21	4	0.820
6	2	1	2	13	1	0	12	2.924
6	2	1	2	14	1	0	23	4.835
6	2	1	2	15	3	21	0	0.046
6	2	1	2	16	1	0	7	1.529
6	2	1	2	17	3	21	4	0.775
6	2	1	2	18	3	21	3	0.782
6	2	1	2	19	4	29	1	0.151
6	2	1	3	1	3	21	7	1.486
6	2	1	3	2	3	21	4	0.660
6	2	1	3	3	3	21	1	0.513
6	2	1	3	4	1	0	11	1.894
6	2	1	3	5	1	0	10	1.269
6	2	1	3	6	3	21	0	0.141
6	2	1	3	7	1	0	7	1.765
6	2	1	3	8	3	21	3	0.656
6	2	1	3	9	3	21	1	0.236
6	2	1	3	10	3	21	5	1.146
6	2	1	3	11	3	21	3	0.798
6	2	1	3	12	1	0	8	1.974
6	2	1	3	13	3	21	6	0.787
6	2	1	3	14	3	21	4	0.555
6	2	1	3	15	3	21	2	0.607
6	2	1	3	16	1	0	0	0.785
6	2	1	3	17	4	29	0	0.059
6	2	1	3	18	3	21	1	0.153
6	2	1	3	19	3	21	1	0.266
6	2	1	3	20	3	21	1	0.356
6	2	2	1	1	1	0	14	3.061
6	2	2	1	2	1	0	12	5.949
6	2	2	1	3	1	0	14	3.983
6	2	2	1	4	2	8	8	1.828
6	2	2	1	5	1	0	16	4.097
6	2	2	1	6	1	0	22	6.150
6	2	2	1	7	2	8	11	2.063
6	2	2	1	8	2	8	8	2.044
6	2	2	1	9	2	8	9	2.453
6	2	2	1	10	1	0	12	2.624

A	B	C	D	E	F	G	H	I
6	2	2	1	11	3	21	5	0.591
6	2	2	1	12	1	0	11	2.360
6	2	2	1	13	3	21	10	1.623
6	2	2	1	14	2	8	12	1.739
6	2	2	1	15	1	0	22	3.429
6	2	2	1	16	2	8	25	4.279
6	2	2	1	17	3	21	9	2.161
6	2	2	1	18	1	0	31	10.030
6	2	2	1	19	2	8	8	1.405
6	2	2	1	20	1	0	21	4.877
6	2	2	2	1	3	21	6	1.567
6	2	2	2	2	1	0	17	5.689
6	2	2	2	3	2	8	6	2.118
6	2	2	2	4	3	21	4	0.810
6	2	2	2	5	3	21	2	0.423
6	2	2	2	6	1	0	12	3.972
6	2	2	2	7	1	0	2	0.324
6	2	2	2	8	1	0	15	3.644
6	2	2	2	9	1	0	11	2.748
6	2	2	2	10	1	0	13	3.535
6	2	2	2	11	3	21	3	0.617
6	2	2	2	12	1	0	15	3.050
6	2	2	2	13	1	0	2	4.738
6	2	2	2	14	1	0	22	5.834
6	2	2	2	15	4	29	0	0.136
6	2	2	2	16	1	0	14	4.040
6	2	2	2	17	3	21	4	1.587
6	2	2	2	18	3	21	6	1.367
6	2	2	2	19	2	8	7	2.466
6	2	2	2	20	1	0	16	3.425
6	2	2	3	1	2	8	3	0.825
6	2	2	3	2	2	8	10	1.603
6	2	2	3	3	1	0	8	1.578
6	2	2	3	4	1	0	17	5.084
6	2	2	3	5	2	8	5	1.149
6	2	2	3	6	3	21	3	0.671
6	2	2	3	7	2	8	2	0.331
6	2	2	3	8	5	43	0	0.020
6	2	2	3	9	3	21	1	0.345
6	2	2	3	10	2	8	15	1.828
6	2	2	3	11	2	8	16	3.364
6	2	2	3	12	3	21	1	0.351
6	2	2	3	13	1	0	18	3.136
6	2	2	3	14	1	0	16	3.439
6	2	2	3	15	1	0	13	2.972
6	2	2	3	16	1	0	10	2.018
6	2	2	3	17	3	21	5	0.748
6	2	2	3	18	1	0	21	4.085
6	2	2	3	19	1	0	11	1.972
6	2	2	3	20	3	21	5	0.863
6	3	1	1	1	1	0	14	5.173
6	3	1	1	2	3	21	1	0.150
6	3	1	1	3	1	0	15	5.253
6	3	1	1	4	1	0	9	3.208
6	3	1	1	5	1	0	6	1.714
6	3	1	1	6	3	21	7	2.115
6	3	1	1	7	1	0	16	4.361
6	3	1	1	8	1	0	20	5.541
6	3	1	1	9	3	21	7	2.586
6	3	1	1	10	3	21	19	6.441
6	3	1	1	11	3	21	1	0.334
6	3	1	1	12	4	29	1	0.341
6	3	1	1	13	1	0	14	4.522
6	3	1	1	14	1	0	18	3.819
6	3	1	1	15	3	21	6	1.434
6	3	1	1	16	2	8	1	0.443

A	B	C	D	E	F	G	H	I
6	3	1	1	17	2	8	9	2.176
6	3	1	1	18	3	21	5	2.069
6	3	1	1	19	1	0	18	4.580
6	3	1	1	20	1	0	21	6.618
6	3	1	2	1	5	43	1	0.466
6	3	1	2	2	4	29	8	1.567
6	3	1	2	3	4	29	1	0.265
6	3	1	2	4	6	51	0	0.078
6	3	1	2	5	5	43	0	0.062
6	3	1	2	6	2	8	12	2.284
6	3	1	2	7	4	29	0	0.020
6	3	1	2	8	3	21	4	2.007
6	3	1	2	9	4	29	7	1.244
6	3	1	2	10	4	29	7	1.254
6	3	1	2	11	5	43	1	0.279
6	3	1	2	12	3	21	9	1.771
6	3	1	2	13	4	29	3	0.833
6	3	1	2	14	3	21	7	2.228
6	3	1	2	15	3	21	12	3.468
6	3	1	2	16	3	21	12	3.435
6	3	1	2	17	4	29	1	0.135
6	3	1	2	18	4	29	2	1.261
6	3	1	2	19	3	21	6	2.085
6	3	1	2	20	4	29	7	0.987
6	3	1	3	1	3	21	13	3.403
6	3	1	3	2	4	29	1	0.363
6	3	1	3	3	4	29	0	0.094
6	3	1	3	4	3	21	3	1.337
6	3	1	3	5	3	21	5	1.202
6	3	1	3	6	3	21	10	3.098
6	3	1	3	7	4	29	1	0.730
6	3	1	3	8	1	0	10	5.354
6	3	1	3	9	3	21	4	1.247
6	3	1	3	10	3	21	2	0.475
6	3	1	3	11	3	21	0	0.115
6	3	1	3	12	4	29	0	0.113
6	3	1	3	13	3	21	11	3.861
6	3	1	3	14	3	21	7	1.923
6	3	1	3	15	3	21	0	0.020
6	3	1	3	16	3	21	13	2.638
6	3	1	3	17	8	90	0	0.014
6	3	2	1	1	2	8	12	3.661
6	3	2	1	2	1	0	5	1.427
6	3	2	1	3	2	8	9	2.290
6	3	2	1	4	1	0	10	1.899
6	3	2	1	5	2	8	6	1.898
6	3	2	1	6	1	0	13	3.355
6	3	2	1	7	2	8	12	2.564
6	3	2	1	8	1	0	11	2.522
6	3	2	1	9	1	0	11	3.565
6	3	2	1	10	1	0	7	1.761
6	3	2	1	11	3	21	5	0.691
6	3	2	1	12	1	0	13	2.587
6	3	2	1	13	1	0	12	3.022
6	3	2	1	14	1	0	9	2.358
6	3	2	1	15	1	0	6	2.164
6	3	2	1	16	1	0	13	2.528
6	3	2	1	17	1	0	9	2.091
6	3	2	1	18	3	21	0	0.198
6	3	2	1	19	1	0	12	2.500
6	3	2	1	20	1	0	6	3.067
6	3	2	2	1	1	0	26	7.923
6	3	2	2	2	3	21	6	1.351
6	3	2	2	3	1	0	10	1.585
6	3	2	2	4	1	0	12	2.972
6	3	2	2	5	1	0	10	1.541
6	3	2	2	6	2	8	7	1.083
6	3	2	2	7	2	8	9	1.685
6	3	2	2	8	2	8	17	3.522
6	3	2	2	9	2	8	4	0.830
6	3	2	2	10	2	8	5	1.178
6	3	2	2	11	2	8	3	0.597
6	3	2	2	12	1	0	10	2.279
6	3	2	2	13	2	8	10	0.999
6	3	2	2	14	2	8	7	1.645
6	3	2	2	15	2	8	14	2.932
6	3	2	2	16	3	21	1	0.173
6	3	2	3	1	3	21	1	0.364
6	3	2	3	2	1	0	30	11.802
6	3	2	3	3	3	21	9	2.583
6	3	2	3	4	2	8	15	7.206
6	3	2	3	5	3	21	3	0.841
6	3	2	3	6	1	0	16	6.530
6	3	2	3	7	2	8	20	6.485
6	3	2	3	8	3	21	7	1.877
6	3	2	3	9	1	0	9	4.170
6	3	2	3	10	3	21	3	0.747
6	3	2	3	11	2	8	11	4.031
6	3	2	3	12	4	29	10	3.529
6	3	2	3	13	1	0	15	5.317
6	3	2	3	14	3	21	8	2.030
6	3	2	3	15	3	21	6	0.788
6	3	2	3	16	3	21	7	2.979
6	3	2	3	17	2	8	17	3.539
6	3	2	3	18	3	21	8	2.156
6	3	2	3	19	3	21	10	3.383
6	3	2	3	20	3	21	4	1.134
6	4	1	1	1	3	21	6	1.767
6	4	1	1	2	3	21	2	0.515
6	4	1	1	3	2	8	7	1.322
6	4	1	1	4	1	0	9	1.806
6	4	1	1	5	3	21	1	0.574
6	4	1	1	6	3	21	4	1.001
6	4	1	1	7	3	21	5	1.397
6	4	1	1	8	2	8	6	0.697
6	4	1	1	9	1	0	4	1.136
6	4	1	1	10	3	21	2	0.486
6	4	1	1	11	3	21	6	0.744
6	4	1	1	12	8	90	0	0.029
6	4	1	1	13	3	21	5	0.993
6	4	1	1	14	1	0	6	1.107
6	4	1	2	1	3	21	8	1.354
6	4	1	2	2	1	0	8	1.631
6	4	1	2	3	3	21	6	0.960
6	4	1	2	4	4	29	3	0.629
6	4	1	2	5	4	29	6	0.774
6	4	1	2	6	3	21	24	5.312
6	4	1	2	7	5	43	2	0.483
6	4	1	2	8	3	21	10	1.921
6	4	1	2	9	3	21	3	0.626
6	4	1	2	10	3	21	10	1.971
6	4	1	2	11	4	29	1	0.277
6	4	1	2	12	1	0	31	6.448
6	4	1	3	1	1	0	14	3.947
6	4	1	3	2	3	21	5	1.213
6	4	1	3	3	2	8	8	2.237
6	4	1	3	4	1	0	10	3.248
6	4	1	3	5	1	0	22	5.905
6	4	1	3	6	3	21	6	2.082
6	4	1	3	7	1	0	15	3.994
6	4	1	3	8	1	0	13	5.045
6	4	1	3	9	1	0	9	2.584

A	B	C	D	E	F	G	H	I
6	5	1	2	1	3	21	6	1.137
6	5	1	2	2	4	29	2	0.392
6	5	1	2	3	3	21	0	0.137
6	5	1	2	4	3	21	2	0.451
6	5	1	2	5	5	43	0	0.033
6	5	1	2	6	4	29	1	0.200
6	5	1	2	7	3	21	5	1.039
6	5	1	2	8	3	21	4	0.656
6	5	1	2	9	3	21	4	1.359
6	5	1	2	10	8	90	0	0.022
6	5	1	2	11	5	43	0	0.106
6	5	1	2	12	4	29	1	0.128
6	5	1	2	13	3	21	3	0.633
6	5	1	2	14	3	21	5	0.552
6	5	1	2	15	3	21	5	0.626
6	5	1	2	16	3	21	3	0.550
6	5	1	2	17	3	21	2	1.337
6	5	1	3	1	3	21	8	1.029
6	5	1	3	2	3	21	3	0.909
6	5	1	3	3	4	29	2	0.398
6	5	1	3	4	3	21	1	0.163
6	5	1	3	5	3	21	5	1.168
6	5	1	3	6	3	21	5	0.842
6	5	1	3	7	3	21	6	0.834
6	5	1	3	8	3	21	0	0.230
6	5	1	3	9	3	21	3	0.776
6	5	1	3	10	3	21	4	0.903
6	5	1	3	11	4	29	3	0.560
6	5	1	3	12	3	21	4	0.408
6	5	1	3	13	8	90	0	0.023
6	5	1	3	14	3	21	8	1.966
6	5	1	3	15	3	21	4	0.802
6	5	2	1	1	2	8	1	0.235
6	5	2	1	2	4	29	0	0.012
6	5	2	1	3	1	0	2	0.837
6	5	2	1	4	3	21	1	0.214
6	5	2	1	5	4	29	0	0.025
6	5	2	1	6	1	0	2	0.323
6	5	2	1	7	1	0	2	0.558
6	5	2	1	8	3	21	1	0.156
6	5	2	1	9	3	21	2	0.182
6	5	2	1	10	3	21	2	0.466
6	5	2	1	11	1	0	3	0.689
6	5	2	1	12	3	21	0	0.013
6	5	2	1	13	1	0	0	0.180
6	5	2	1	14	2	8	1	0.214
6	5	2	1	15	2	8	1	0.423
6	5	2	1	16	2	8	2	0.583
6	5	2	1	17	2	8	1	0.354
6	5	2	1	18	5	43	0	0.007
6	5	2	1	19	3	21	1	0.353
6	5	2	1	20	3	21	0	0.129
6	5	2	2	1	2	8	8	1.476
6	5	2	2	2	2	8	5	1.208
6	5	2	2	3	1	0	3	1.460
6	5	2	2	4	3	21	1	0.605
6	5	2	2	5	1	0	5	1.942
6	5	2	2	6	1	0	3	0.923
6	5	2	2	7	3	21	2	0.516
6	5	2	2	8	2	8	2	0.707
6	5	2	2	9	1	0	3	0.821
6	5	2	2	10	1	0	2	0.580
6	5	2	2	11	2	8	1	0.544
6	5	2	2	12	1	0	3	1.072
6	5	2	2	13	2	8	4	0.990
6	5	2	2	14	1	0	8	1.630

A	B	C	D	E	F	G	H	I
6	4	1	3	10	3	21	2	1.295
6	4	1	3	11	3	21	7	1.732
6	4	1	3	12	1	0	12	3.727
6	4	1	3	13	1	0	5	2.946
6	4	1	3	14	3	21	9	3.090
6	4	2	1	1	2	8	7	1.644
6	4	2	1	2	2	8	17	4.627
6	4	2	1	3	1	0	18	6.685
6	4	2	1	4	3	21	2	0.521
6	4	2	1	5	1	0	8	3.039
6	4	2	1	6	1	0	15	5.276
6	4	2	1	7	3	21	5	0.888
6	4	2	1	8	2	8	9	2.576
6	4	2	1	9	1	0	11	3.822
6	4	2	1	10	1	0	14	2.762
6	4	2	1	11	3	21	13	2.212
6	4	2	1	12	1	0	20	4.734
6	4	2	1	13	3	21	4	0.867
6	4	2	1	14	4	29	0	0.384
6	4	2	1	15	4	29	0	0.077
6	4	2	1	16	4	29	0	0.053
6	4	2	2	1	1	0	2	1.752
6	4	2	2	2	1	0	16	5.503
6	4	2	2	3	3	21	11	3.125
6	4	2	2	4	1	0	15	6.656
6	4	2	2	5	1	0	15	7.428
6	4	2	2	6	1	0	14	4.233
6	4	2	2	7	1	0	13	4.087
6	4	2	2	8	2	8	12	3.662
6	4	2	2	9	1	0	20	8.692
6	4	2	2	10	1	0	10	5.343
6	4	2	2	11	3	21	2	0.440
6	4	2	2	12	3	21	1	0.456
6	4	2	2	13	3	21	1	0.561
6	4	2	2	14	3	21	8	1.832
6	4	2	2	15	1	0	32	9.642
6	4	2	2	16	2	8	12	6.613
6	4	2	2	17	1	0	16	8.677
6	4	2	3	1	2	8	12	3.312
6	4	2	3	2	3	21	2	0.800
6	4	2	3	3	3	21	3	1.416
6	4	2	3	4	1	0	22	7.404
6	4	2	3	5	2	8	18	5.757
6	4	2	3	6	1	0	8	3.765
6	4	2	3	7	3	21	3	0.641
6	4	2	3	8	1	0	20	9.921
6	4	2	3	9	2	8	8	2.188
6	4	2	3	10	1	0	9	3.582
6	4	2	3	11	1	0	8	2.482
6	4	2	3	12	3	21	2	0.264
6	4	2	3	13	3	21	5	1.373
6	4	2	3	14	1	0	10	6.171
6	4	2	3	15	3	21	13	5.773
6	4	2	3	16	2	8	12	7.307
6	5	1	1	1	3	21	4	1.066
6	5	1	1	2	1	0	6	2.593
6	5	1	1	3	4	29	0	0.113
6	5	1	1	4	3	21	3	0.280
6	5	1	1	5	1	0	5	0.831
6	5	1	1	6	3	21	3	0.894
6	5	1	1	7	5	43	0	0.012
6	5	1	1	8	3	21	6	1.769
6	5	1	1	9	4	29	0	0.037
6	5	1	1	10	3	21	2	0.290
6	5	1	1	11	1	0	5	1.174
6	5	1	1	12	3	21	1	0.241

A	B	C	D	E	F	G	H	I
6	5	2	2	15	3	21	3	0.824
6	5	2	2	16	1	0	3	1.414
6	5	2	3	1	2	8	2	0.405
6	5	2	3	2	1	0	4	0.605
6	5	2	3	3	3	21	4	0.610
6	5	2	3	4	3	21	0	0.148
6	5	2	3	5	1	0	3	0.634
6	5	2	3	6	2	8	5	0.784
6	5	2	3	7	3	21	2	0.425
6	5	2	3	8	2	8	5	1.364
6	5	2	3	9	2	8	0	0.030
6	5	2	3	10	1	0	4	0.700
6	5	2	3	11	1	0	2	0.542
6	5	2	3	12	1	0	2	0.675
6	5	2	3	13	3	21	1	0.249
6	5	2	3	14	1	0	2	0.649
6	5	2	3	15	1	0	2	0.470
6	5	2	3	16	1	0	2	0.678
6	5	2	3	17	2	8	2	0.270
7	1	1	1	1	3	21	10	4.648
7	1	1	1	2	3	21	0	0.725
7	1	1	1	3	1	0	1	4.039
7	1	1	1	4	9	107	0	0.006
7	1	1	1	5	9	107	0	0.007
7	1	1	3	1	1	0	4	1.974
7	1	1	3	2	3	21	0	0.163
7	1	1	3	3	3	21	2	0.925
7	1	1	3	4	2	8	3	1.098
7	1	1	3	5	1	0	3	1.615
7	1	2	1	1	2	8	2	1.722
7	1	2	1	2	9	107	0	0.002
7	1	2	3	1	4	29	1	0.960
7	1	2	3	2	4	29	7	6.393
7	1	2	3	3	9	107	0	0.064
7	1	2	3	4	9	107	0	0.032
7	1	2	3	5	9	107	0	0.005
7	1	2	3	6	9	107	0	0.027
7	2	1	1	1	3	21	2	3.122
7	2	1	1	2	2	8	6	5.744
7	2	1	1	3	3	21	5	3.374
7	2	1	1	4	9	107	0	0.004
7	2	1	1	5	9	107	0	0.003
7	2	1	1	6	9	107	0	0.004
7	2	1	1	7	9	107	0	0.002
7	2	1	1	8	9	107	0	0.015
7	2	1	1	9	9	107	0	0.010
7	2	1	1	10	9	107	0	0.011
7	2	1	1	11	9	107	0	0.013
7	2	1	1	12	9	107	0	0.003
7	2	1	1	13	9	107	0	0.005
7	2	1	1	14	9	107	0	0.006
7	2	1	1	15	9	107	0	0.003
7	2	1	1	16	9	107	0	0.007
7	2	1	1	17	9	107	0	0.002
7	2	1	1	18	9	107	0	0.010
7	2	1	1	19	9	107	0	0.006
7	2	1	1	20	9	107	0	0.004
7	2	1	2	1	4	29	1	0.344
7	2	1	2	2	1	0	7	3.419
7	2	1	2	3	3	21	1	0.650
7	2	1	2	4	4	29	0	0.081
7	2	1	2	5	9	107	0	0.009
7	2	1	2	6	9	107	0	0.002
7	2	1	2	7	9	107	0	0.008
7	2	1	2	8	9	107	0	0.008
7	2	1	2	9	9	107	0	0.004

A	B	C	D	E	F	G	H	I
7	2	1	2	10	9	107	0	0.003
7	2	1	2	11	9	107	0	0.012
7	2	1	2	12	9	107	0	0.006
7	2	1	2	13	9	107	0	0.023
7	2	1	2	14	9	107	0	0.015
7	2	1	2	15	9	107	0	0.012
7	2	1	2	16	9	107	0	0.003
7	2	1	3	1	2	8	14	14.229
7	2	1	3	2	4	29	4	1.797
7	2	1	3	3	1	0	12	11.678
7	2	1	3	4	9	107	0	0.022
7	2	1	3	5	9	107	0	0.022
7	2	1	3	6	9	107	0	0.014
7	2	1	3	7	9	107	0	0.008
7	2	1	3	8	10	119	0	0.005
7	2	1	3	9	9	107	0	0.005
7	2	1	3	10	9	107	0	0.006
7	2	1	3	11	9	107	0	0.007
7	2	1	3	12	9	107	0	0.012
7	2	1	3	13	9	107	0	0.006
7	2	1	3	14	9	107	0	0.005
7	2	1	3	15	9	107	0	0.004
7	2	1	3	16	9	107	0	0.011
7	2	1	3	17	9	107	0	0.009
7	2	1	3	18	9	107	0	0.009
7	2	1	3	19	9	107	0	0.008
7	2	1	3	20	9	107	0	0.004
7	2	2	1	1	3	21	2	0.942
7	2	2	1	2	3	21	4	2.230
7	2	2	1	3	9	107	0	0.005
7	2	2	1	4	9	107	0	0.006
7	2	2	1	5	9	107	0	0.004
7	2	2	1	6	9	107	0	0.004
7	2	2	1	7	9	107	0	0.001
7	2	2	1	8	9	107	0	0.001
7	2	2	1	9	9	107	0	0.005
7	2	2	2	1	3	21	6	3.647
7	2	2	2	2	3	21	7	3.190
7	2	2	2	3	4	29	0	0.306
7	2	2	2	4	3	21	8	3.907
7	2	2	2	5	3	21	3	1.335
7	2	2	2	6	3	21	3	1.006
7	2	2	2	7	3	21	3	0.976
7	2	2	2	8	3	21	1	0.792
7	2	2	2	9	9	107	0	0.004
7	2	2	2	10	9	107	0	0.003
7	2	2	2	11	9	107	0	0.001
7	2	2	2	12	9	107	0	0.001
7	2	2	2	13	9	107	0	0.002
7	2	2	2	14	9	107	0	0.002
7	2	2	2	15	9	107	0	0.002
7	2	2	2	16	9	107	0	0.001
7	2	2	3	1	3	21	6	3.112
7	2	2	3	2	3	21	9	3.373
7	2	2	3	3	3	21	2	1.112
7	2	2	3	4	3	21	2	0.524
7	2	2	3	5	9	107	0	0.000
7	2	2	3	6	9	107	0	0.005
7	2	2	3	7	9	107	0	0.003
7	2	2	3	8	9	107	0	0.001
7	3	1	1	1	1	0	16	5.067
7	3	1	1	2	1	0	16	5.410
7	3	1	1	3	9	107	0	0.011
7	3	1	1	4	9	107	0	0.003
7	3	1	1	5	9	107	0	0.006
7	3	1	1	6	9	107	0	0.001

A	B	C	D	E	F	G	H	I
7	3	1	1	7	9	107	0	0.004
7	3	1	1	8	9	107	0	0.008
7	3	1	1	9	9	107	0	0.004
7	3	1	1	10	9	107	0	0.001
7	3	1	1	11	9	107	0	0.007
7	3	1	1	12	9	107	0	0.009
7	3	1	1	13	9	107	0	0.009
7	3	1	1	14	9	107	0	0.003
7	3	1	1	15	9	107	0	0.012
7	3	1	1	16	9	107	0	0.008
7	3	1	1	17	9	107	0	0.003
7	3	1	1	18	9	107	0	0.013
7	3	1	1	19	9	107	0	0.009
7	3	1	1	20	9	107	0	0.001
7	3	1	2	1	9	107	0	0.038
7	3	1	2	2	9	107	0	0.048
7	3	1	2	3	9	107	0	0.011
7	3	1	2	4	9	107	0	0.052
7	3	1	2	5	9	107	0	0.056
7	3	1	2	6	9	107	0	0.051
7	3	1	2	7	9	107	0	0.058
7	3	1	2	8	9	107	0	0.023
7	3	1	2	9	9	107	0	0.016
7	3	1	2	10	9	107	0	0.076
7	3	1	2	11	9	107	0	0.043
7	3	1	2	12	9	107	0	0.020
7	3	1	2	13	9	107	0	0.023
7	3	1	3	1	9	107	0	0.047
7	3	1	3	2	9	107	0	0.065
7	3	1	3	3	9	107	0	0.037
7	3	1	3	4	9	107	0	0.100
7	3	1	3	5	9	107	0	0.138
7	3	1	3	6	9	107	0	0.056
7	3	1	3	7	9	107	0	0.072
7	3	1	3	8	9	107	0	0.066
7	3	1	3	9	9	107	0	0.035
7	3	1	3	10	9	107	0	0.049
7	3	1	3	11	9	107	0	0.056
7	3	1	3	12	9	107	0	0.065
7	3	1	3	13	9	107	0	0.064
7	3	1	3	14	9	107	0	0.047
7	3	1	3	15	9	107	0	0.028
7	3	1	3	16	9	107	0	0.030
7	3	1	3	17	9	107	0	0.029
7	3	1	3	18	9	107	0	0.029
7	3	1	3	19	9	107	0	0.028
7	3	1	3	20	9	107	0	0.029
7	3	2	1	1	3	21	8	2.140
7	3	2	1	2	3	21	2	0.899
7	3	2	1	3	3	21	6	2.413
7	3	2	1	4	1	0	11	7.193
7	3	2	1	5	3	21	3	0.780
7	3	2	1	6	9	107	0	0.026
7	3	2	1	7	9	107	0	0.010
7	3	2	1	8	9	107	0	0.008
7	3	2	1	9	9	107	0	0.007
7	3	2	2	1	1	0	352	9.070
7	3	2	2	2	9	107	0	0.008
7	3	2	2	3	9	107	0	0.004
7	3	2	2	4	9	107	0	0.007
7	3	2	2	5	9	107	0	0.010
7	3	2	2	6	9	107	0	0.007
7	3	2	2	7	9	107	0	0.012
7	3	2	2	8	9	107	0	0.010
7	3	2	2	9	9	107	0	0.020
7	3	2	2	10	9	107	0	0.013

A	B	C	D	E	F	G	H	I
7	3	2	2	11	9	107	0	0.017
7	3	2	2	12	9	107	0	0.009
7	3	2	2	13	9	107	0	0.002
7	3	2	2	14	9	107	0	0.001
7	3	2	2	15	9	107	0	0.005
7	3	2	2	16	9	107	0	0.012
7	3	2	2	17	9	107	0	0.011
7	3	2	2	18	9	107	0	0.009
7	3	2	2	19	9	107	0	0.006
7	3	2	3	1	9	107	0	0.041
7	3	2	3	2	9	107	0	0.019
7	3	2	3	3	9	107	0	0.010
7	3	2	3	4	9	107	0	0.035
7	3	2	3	5	9	107	0	0.033
7	3	2	3	6	9	107	0	0.044
7	3	2	3	7	9	107	0	0.033
7	3	2	3	8	9	107	0	0.022
7	3	2	3	9	9	107	0	0.014
7	4	1	1	1	9	107	0	0.067
7	4	1	1	2	9	107	0	0.005
7	4	1	1	3	9	107	0	0.001
7	4	1	2	1	3	21	1	0.986
7	4	1	2	2	2	8	3	1.211
7	4	1	2	3	9	107	0	0.006
7	4	1	2	4	9	107	0	0.001
7	4	1	2	5	9	107	0	0.005
7	4	1	2	6	9	107	0	0.005
7	4	1	2	7	9	107	0	0.008
7	4	1	3	1	9	107	0	0.004
7	4	1	3	2	9	107	0	0.004
7	4	1	3	3	9	107	0	0.019
7	4	2	1	1	4	29	2	1.936
7	4	2	1	2	9	107	0	0.002
7	4	2	1	3	9	107	0	0.004
7	4	2	1	4	9	107	0	0.001
7	4	2	1	5	9	107	0	0.002
7	4	2	1	6	9	107	0	0.002
7	4	2	1	7	9	107	0	0.005
7	4	2	1	8	9	107	0	0.001
7	4	2	1	9	9	107	0	0.003
7	4	2	1	10	9	107	0	0.003
7	4	2	2	1	2	8	5	3.752
7	4	2	2	2	9	107	0	0.123
7	4	2	2	3	9	107	0	0.047
7	4	2	2	4	9	107	0	0.030
7	4	2	2	5	9	107	0	0.018
7	4	2	2	6	9	107	0	0.018
7	4	2	2	7	9	107	0	0.004
7	4	2	2	8	9	107	0	0.007
7	4	2	2	9	9	107	0	0.005
7	4	2	2	10	9	107	0	0.005
7	4	2	2	11	9	107	0	0.026
7	4	2	2	12	9	107	0	0.008
7	4	2	3	1	4	29	5	3.168
7	4	2	3	2	9	107	0	0.003
7	4	2	3	3	9	107	0	0.001
7	4	2	3	4	9	107	0	0.001
7	4	2	3	5	9	107	0	0.008
7	4	2	3	6	9	107	0	0.002
7	4	2	3	7	9	107	0	0.004
7	4	2	3	8	9	107	0	0.003
7	4	2	3	9	9	107	0	0.005
7	4	2	3	10	9	107	0	0.004
7	5	1	1	1	4	29	0	0.062
7	5	1	1	2	9	107	0	0.009
7	5	1	1	3	9	107	0	0.055

A	B	C	D	E	F	G	H	I
7	5	1	1	4	9	107	0	0.054
7	5	1	1	5	9	107	0	0.011
7	5	1	2	1	2	8	5	4.429
7	5	1	2	2	9	107	0	0.014
7	5	1	2	3	9	107	0	0.009
7	5	1	2	4	9	107	0	0.020
7	5	1	2	5	9	107	0	0.004
7	5	1	2	6	9	107	0	0.007
7	5	1	2	7	9	107	0	0.015
7	5	1	2	8	9	107	0	0.013
7	5	1	2	9	9	107	0	0.005
7	5	1	2	10	9	107	0	0.009
7	5	1	2	11	9	107	0	0.005
7	5	1	2	12	9	107	0	0.012
7	5	1	2	13	9	107	0	0.010
7	5	1	2	14	9	107	0	0.008
7	5	1	2	15	9	107	0	0.003
7	5	1	2	16	9	107	0	0.012
7	5	1	3	1	9	107	0	0.010
7	5	1	3	2	9	107	0	0.011
7	5	1	3	3	9	107	0	0.020
7	5	1	3	4	9	107	0	0.011
7	5	1	3	5	9	107	0	0.013
7	5	1	3	6	9	107	0	0.011
7	5	1	3	7	9	107	0	0.021
7	5	1	3	8	9	107	0	0.014
7	5	1	3	9	9	107	0	0.027
7	5	1	3	10	9	107	0	0.009
7	5	1	3	11	9	107	0	0.019
7	5	1	3	12	9	107	0	0.021
7	5	1	3	13	9	107	0	0.010
7	5	1	3	14	9	107	0	0.014
7	5	1	3	15	9	107	0	0.007
7	5	1	3	16	9	107	0	0.016
7	5	1	3	17	9	107	0	0.012
7	5	1	3	18	9	107	0	0.014
7	5	1	3	19	9	107	0	0.015
7	5	1	3	20	9	107	0	0.005
7	5	2	1	1	4	29	1	1.769
7	5	2	1	2	5	43	0	0.568
7	5	2	1	3	3	21	4	4.164
7	5	2	1	4	1	0	1	5.940
7	5	2	2	1	3	21	6	10.012
7	5	2	2	2	4	29	3	2.092
7	5	2	2	3	2	8	1	3.243
7	5	2	2	4	9	107	0	0.062
7	5	2	2	5	9	107	0	0.149
7	5	2	2	6	9	107	0	0.063
7	5	2	2	7	9	107	0	0.017
7	5	2	2	8	9	107	0	0.007
7	5	2	2	9	9	107	0	0.008
7	5	2	2	10	9	107	0	0.004
7	5	2	2	11	9	107	0	0.003
7	5	2	2	12	9	107	0	0.003
7	5	2	2	13	9	107	0	0.001
7	5	2	2	14	9	107	0	0.001
7	5	2	2	15	9	107	0	0.015
7	5	2	2	16	9	107	0	0.003
7	5	2	2	17	9	107	0	0.017
7	5	2	2	18	9	107	0	0.005
7	5	2	2	19	9	107	0	0.006
7	5	2	2	20	9	107	0	0.003
7	5	2	3	1	9	107	0	0.024
7	5	2	3	2	9	107	0	0.091
7	5	2	3	3	9	107	0	0.021
8	1	1	1	1	1	0	2	2.553

A	B	C	D	E	F	G	H	I
8	1	1	1	2	2	8	1	0.361
8	1	1	1	3	1	0	1	1.689
8	1	1	1	4	2	8	1	0.659
8	1	1	1	5	1	0	3	3.252
8	1	1	1	6	1	0	5	3.290
8	1	1	1	7	1	0	2	2.144
8	1	1	1	8	1	0	0	1.675
8	1	1	1	9	1	0	1	1.010
8	1	1	1	10	1	0	2	2.070
8	1	1	1	11	1	0	0	0.853
8	1	1	1	12	1	0	8	6.832
8	1	1	1	13	3	21	0	0.110
8	1	1	1	14	1	0	5	3.648
8	1	1	1	15	1	0	2	2.859
8	1	1	1	16	1	0	5	1.464
8	1	1	2	1	3	21	5	4.446
8	1	1	2	2	2	8	2	2.677
8	1	1	2	3	2	8	5	4.851
8	1	1	2	4	1	0	2	3.097
8	1	1	2	5	1	0	0	2.176
8	1	1	2	6	1	0	0	3.553
8	1	1	2	7	1	0	1	1.462
8	1	1	3	1	1	0	0	1.597
8	1	1	3	2	1	0	0	3.194
8	1	1	3	3	1	0	0	0.657
8	1	1	3	4	1	0	1	0.972
8	1	1	3	5	1	0	1	1.461
8	1	1	3	6	3	21	0	0.038
8	1	2	1	1	1	0	2	2.064
8	1	2	1	2	1	0	0	1.583
8	1	2	1	3	1	0	1	2.773
8	1	2	1	4	1	0	0	0.733
8	1	2	1	5	1	0	0	0.990
8	1	2	1	6	1	0	2	1.806
8	1	2	1	7	1	0	0	1.230
8	1	2	1	8	1	0	2	1.739
8	1	2	1	9	1	0	0	0.082
8	1	2	1	10	1	0	0	1.612
8	1	2	1	11	1	0	0	1.017
8	1	2	1	12	1	0	1	1.654
8	1	2	1	13	5	43	0	0.023
8	1	2	1	14	1	0	0	0.256
8	1	2	1	15	1	0	0	0.313
8	1	2	1	16	1	0	3	2.387
8	1	2	1	17	1	0	0	1.346
8	1	2	1	18	1	0	0	0.611
8	1	2	1	19	1	0	0	1.306
8	1	2	1	20	1	0	0	1.383
8	1	2	2	1	1	0	4	2.878
8	1	2	2	2	1	0	1	0.908
8	1	2	2	3	1	0	0	0.705
8	1	2	2	4	1	0	0	0.828
8	1	2	2	5	1	0	2	1.479
8	1	2	2	6	1	0	3	4.465
8	1	2	2	7	1	0	0	1.523
8	1	2	2	8	1	0	1	3.109
8	1	2	2	9	1	0	3	2.421
8	1	2	2	10	1	0	4	8.564
8	1	2	3	1	1	0	6	3.749
8	1	2	3	2	1	0	5	2.963
8	1	2	3	3	1	0	4	3.613
8	1	2	3	4	2	8	2	1.473
8	1	2	3	5	1	0	2	1.301
8	1	2	3	6	1	0	5	2.735
8	1	2	3	7	1	0	3	2.063
8	1	2	3	8	1	0	4	2.210

A	B	C	D	E	F	G	H	I
8	1	2	3	9	1	0	2	3.308
8	1	2	3	10	2	8	1	0.991
8	1	2	3	11	1	0	1	1.467
8	1	2	3	12	1	0	2	1.842
8	1	2	3	13	1	0	0	0.786
8	1	2	3	14	1	0	1	2.009
8	1	2	3	15	2	8	0	0.714
8	1	2	3	16	1	0	0	0.548
8	1	2	3	17	1	0	7	2.725
8	1	2	3	18	1	0	4	2.782
8	2	1	1	1	1	0	3	1.740
8	2	1	1	2	1	0	5	2.700
8	2	1	1	3	1	0	3	2.738
8	2	1	1	4	2	8	1	1.354
8	2	1	1	5	1	0	8	7.026
8	2	1	1	6	1	0	4	3.712
8	2	1	1	7	1	0	3	4.539
8	2	1	1	8	1	0	0	2.034
8	2	1	1	9	1	0	4	3.654
8	2	1	1	10	1	0	2	1.481
8	2	1	1	11	1	0	2	1.078
8	2	1	1	12	1	0	2	2.042
8	2	1	1	13	1	0	1	0.808
8	2	1	1	14	1	0	0	1.156
8	2	1	1	15	1	0	1	0.700
8	2	1	1	16	1	0	4	2.098
8	2	1	1	17	1	0	1	0.914
8	2	1	1	18	1	0	1	1.375
8	2	1	1	19	1	0	6	4.007
8	2	1	1	20	1	0	2	0.965
8	2	1	2	1	1	0	1	2.001
8	2	1	2	2	2	8	0	0.217
8	2	1	2	3	1	0	0	0.447
8	2	1	2	4	1	0	1	0.295
8	2	1	2	5	3	21	0	0.091
8	2	1	2	6	2	8	0	0.365
8	2	1	2	7	1	0	2	0.878
8	2	1	2	8	1	0	2	1.183
8	2	1	2	9	1	0	2	1.429
8	2	1	2	10	1	0	3	2.296
8	2	1	2	11	2	8	1	0.793
8	2	1	2	12	1	0	3	1.612
8	2	1	2	13	1	0	0	0.549
8	2	1	2	14	1	0	0	0.569
8	2	1	2	15	1	0	3	1.726
8	2	1	2	16	1	0	1	0.422
8	2	1	3	1	1	0	0	0.425
8	2	1	3	2	1	0	0	1.475
8	2	1	3	3	1	0	0	1.008
8	2	1	3	4	1	0	1	0.891
8	2	1	3	5	1	0	0	0.458
8	2	1	3	6	1	0	0	0.668
8	2	1	3	7	1	0	1	1.019
8	2	1	3	8	1	0	0	1.187
8	2	1	3	9	3	21	0	0.458
8	2	1	3	10	1	0	1	0.639
8	2	1	3	11	1	0	0	0.691
8	2	1	3	12	1	0	1	0.578
8	2	1	3	13	1	0	0	0.163
8	2	1	3	14	1	0	1	1.183
8	2	1	3	15	1	0	1	0.709
8	2	1	3	16	1	0	0	0.143
8	2	1	3	17	1	0	1	1.088
8	2	1	3	18	2	8	1	0.560
8	2	1	3	19	1	0	1	1.727
8	2	1	3	20	1	0	0	0.586

A	B	C	D	E	F	G	H	I
8	2	2	1	1	1	0	3	3.326
8	2	2	1	2	2	8	4	2.268
8	2	2	1	3	1	0	1	1.013
8	2	2	1	4	1	0	0	0.372
8	2	2	1	5	1	0	7	5.463
8	2	2	1	6	1	0	2	3.500
8	2	2	1	7	1	0	0	1.165
8	2	2	1	8	1	0	3	3.233
8	2	2	1	9	2	8	7	3.038
8	2	2	1	10	1	0	4	2.746
8	2	2	2	1	1	0	2	1.764
8	2	2	2	2	2	8	0	0.488
8	2	2	2	3	1	0	1	0.783
8	2	2	2	4	1	0	2	1.452
8	2	2	2	5	1	0	0	0.375
8	2	2	2	6	1	0	0	0.987
8	2	2	2	7	1	0	0	0.856
8	2	2	2	8	1	0	4	2.210
8	2	2	2	9	1	0	6	2.593
8	2	2	2	10	1	0	0	0.480
8	2	2	2	11	1	0	0	0.509
8	2	2	2	12	1	0	1	1.009
8	2	2	2	13	2	8	0	0.229
8	2	2	2	14	1	0	0	0.633
8	2	2	2	15	1	0	1	1.031
8	2	2	2	16	1	0	0	0.255
8	2	2	2	17	1	0	0	0.677
8	2	2	2	18	1	0	1	0.990
8	2	2	2	19	1	0	1	0.827
8	2	2	2	20	1	0	0	0.990
8	2	2	3	1	1	0	4	3.417
8	2	2	3	2	1	0	3	3.737
8	2	2	3	3	1	0	3	2.617
8	2	2	3	4	1	0	0	0.654
8	2	2	3	5	1	0	1	0.773
8	2	2	3	6	1	0	4	1.882
8	2	2	3	7	1	0	5	3.433
8	2	2	3	8	1	0	1	1.392
8	2	2	3	9	2	8	0	0.262
8	2	2	3	10	2	8	4	2.184
8	2	2	3	11	1	0	2	1.515
8	2	2	3	12	1	0	0	0.748
8	2	2	3	13	1	0	0	0.646
8	2	2	3	14	1	0	0	0.346
8	2	2	3	15	1	0	2	1.523
8	2	2	3	16	1	0	2	1.368
8	2	2	3	17	1	0	1	0.828
8	2	2	3	18	1	0	2	1.253
8	2	2	3	19	1	0	1	1.093
8	2	2	3	20	1	0	5	2.867
8	3	1	1	1	1	0	5	5.841
8	3	1	1	2	1	0	5	5.941
8	3	1	1	3	1	0	6	4.336
8	3	1	1	4	1	0	3	2.824
8	3	1	1	5	1	0	2	1.152
8	3	1	1	6	2	8	1	0.426
8	3	1	1	7	1	0	3	3.408
8	3	1	1	8	1	0	4	4.990
8	3	1	1	9	1	0	0	0.123
8	3	1	1	10	1	0	1	0.781
8	3	1	1	11	1	0	2	1.651
8	3	1	1	12	3	21	0	0.203
8	3	1	2	1	3	21	2	0.943
8	3	1	2	2	4	29	1	2.264
8	3	1	2	3	1	0	8	20.395
8	3	1	2	4	1	0	7	12.446

A	B	C	D	E	F	G	H	I
8	3	1	2	5	1	0	3	7.513
8	3	1	2	6	3	21	0	1.472
8	3	1	2	7	1	0	8	9.182
8	3	1	3	1	1	0	6	3.768
8	3	1	3	2	1	0	6	4.429
8	3	1	3	3	1	0	5	4.715
8	3	1	3	4	1	0	12	7.867
8	3	1	3	5	1	0	8	6.173
8	3	1	3	6	1	0	10	8.463
8	3	1	3	7	1	0	2	2.115
8	3	1	3	8	1	0	1	1.242
8	3	1	3	9	1	0	1	1.374
8	3	2	1	1	1	0	6	3.899
8	3	2	1	2	1	0	7	5.085
8	3	2	1	3	1	0	2	0.940
8	3	2	1	4	1	0	0	1.327
8	3	2	1	5	1	0	2	1.592
8	3	2	1	6	1	0	2	1.297
8	3	2	1	7	1	0	10	4.736
8	3	2	1	8	1	0	2	1.471
8	3	2	1	9	1	0	3	1.625
8	3	2	1	10	1	0	9	6.290
8	3	2	1	11	1	0	9	4.414
8	3	2	1	12	1	0	6	3.203
8	3	2	1	13	1	0	6	3.726
8	3	2	1	14	1	0	5	2.318
8	3	2	1	15	1	0	3	1.621
8	3	2	2	1	1	0	1	0.645
8	3	2	2	2	1	0	1	0.956
8	3	2	2	3	1	0	8	5.441
8	3	2	2	4	3	21	0	0.745
8	3	2	2	5	2	8	3	1.624
8	3	2	2	6	1	0	2	1.449
8	3	2	2	7	1	0	3	1.647
8	3	2	2	8	1	0	9	4.969
8	3	2	2	9	1	0	6	5.735
8	3	2	2	10	1	0	7	4.123
8	3	2	2	11	1	0	4	6.268
8	3	2	2	12	1	0	4	7.190
8	3	2	3	1	1	0	4	4.542
8	3	2	3	2	1	0	5	4.741
8	3	2	3	3	1	0	6	2.481
8	3	2	3	4	1	0	2	1.720
8	3	2	3	5	1	0	5	3.901
8	3	2	3	6	1	0	8	5.081
8	3	2	3	7	1	0	11	11.589
8	3	2	3	8	2	8	4	3.029
8	3	2	3	9	1	0	4	4.459
8	3	2	3	10	1	0	4	3.700
8	3	2	3	11	2	8	4	2.448
8	3	2	3	12	1	0	14	10.551
8	4	1	1	1	1	0	1	2.132
8	4	1	1	2	1	0	0	0.903
8	4	1	1	3	3	21	0	0.191
8	4	1	1	4	3	21	0	0.140
8	4	1	1	5	3	21	0	0.354
8	4	1	1	6	3	21	0	0.009
8	4	1	1	7	3	21	0	0.077
8	4	1	1	8	1	0	3	2.760
8	4	1	1	9	2	8	0	0.315
8	4	1	1	10	2	8	0	2.352
8	4	1	1	11	1	0	0	0.784
8	4	1	1	12	1	0	0	1.494
8	4	1	2	1	1	0	5	4.395
8	4	1	2	2	1	0	0	1.105
8	4	1	2	3	2	8	0	0.138
8	4	1	2	4	1	0	1	2.983
8	4	1	2	5	2	8	1	2.439
8	4	1	2	6	1	0	2	1.955
8	4	1	3	1	1	0	3	6.631
8	4	1	3	2	1	0	3	3.986
8	4	1	3	3	1	0	0	0.514
8	4	1	3	4	1	0	0	4.261
8	4	1	3	5	1	0	0	0.503
8	4	1	3	6	1	0	1	2.962
8	4	1	3	7	1	0	1	1.926
8	4	1	3	8	1	0	1	0.915
8	4	1	3	9	1	0	1	0.984
8	4	1	3	10	1	0	1	0.613
8	4	1	3	11	3	21	0	0.150
8	4	2	1	1	3	21	1	0.894
8	4	2	1	2	1	0	1	1.646
8	4	2	1	3	1	0	0	1.447
8	4	2	1	4	1	0	0	0.787
8	4	2	1	5	1	0	0	1.144
8	4	2	1	6	1	0	2	1.967
8	4	2	1	7	1	0	1	0.971
8	4	2	1	8	1	0	1	1.972
8	4	2	1	9	1	0	3	4.728
8	4	2	1	10	1	0	0	0.793
8	4	2	1	11	1	0	0	0.496
8	4	2	1	12	1	0	0	1.142
8	4	2	1	13	1	0	0	0.234
8	4	2	1	14	1	0	2	1.881
8	4	2	1	15	1	0	0	1.049
8	4	2	1	16	1	0	3	3.041
8	4	2	1	17	1	0	0	0.534
8	4	2	1	18	1	0	0	0.302
8	4	2	1	19	1	0	2	2.339
8	4	2	1	20	1	0	3	4.197
8	4	2	2	1	1	0	1	1.610
8	4	2	2	2	1	0	3	2.715
8	4	2	2	3	1	0	2	1.573
8	4	2	2	4	1	0	3	1.770
8	4	2	2	5	1	0	2	1.526
8	4	2	2	6	1	0	3	3.107
8	4	2	2	7	1	0	4	2.911
8	4	2	2	8	2	8	3	1.551
8	4	2	2	9	1	0	2	4.082
8	4	2	2	10	1	0	0	0.259
8	4	2	2	11	1	0	3	1.086
8	4	2	2	12	2	8	2	0.661
8	4	2	2	13	1	0	6	3.566
8	4	2	2	14	1	0	3	1.545
8	4	2	2	15	1	0	5	2.884
8	4	2	2	16	1	0	7	4.239
8	4	2	2	17	1	0	6	4.576
8	4	2	2	18	1	0	2	1.114
8	4	2	2	19	1	0	3	2.973
8	4	2	2	20	1	0	5	2.941
8	4	2	3	1	1	0	5	2.036
8	4	2	3	2	1	0	2	1.513
8	4	2	3	3	1	0	3	1.107
8	4	2	3	4	1	0	4	3.996
8	4	2	3	5	1	0	6	3.466
8	4	2	3	6	1	0	0	0.527
8	4	2	3	7	1	0	3	2.235
8	4	2	3	8	1	0	2	4.045
8	4	2	3	9	1	0	5	4.391
8	4	2	3	10	1	0	3	5.357
8	4	2	3	11	2	8	5	4.999
8	5	1	1	1	3	21	0	2.314

A	B	C	D	E	F	G	H	I
8	5	1	1	2	1	0	1	2.041
8	5	1	1	3	1	0	0	0.307
8	5	1	1	4	3	21	0	0.807
8	5	1	1	5	1	0	0	1.574
8	5	1	1	6	1	0	1	0.974
8	5	1	1	7	1	0	0	0.950
8	5	1	1	8	1	0	0	0.683
8	5	1	1	9	1	0	1	1.966
8	5	1	1	10	2	8	0	0.371
8	5	1	2	1	1	0	2	1.368
8	5	1	2	2	1	0	0	0.892
8	5	1	2	3	1	0	2	1.960
8	5	1	2	4	3	21	0	0.619
8	5	1	2	5	3	21	0	0.124
8	5	1	2	6	1	0	0	1.931
8	5	1	2	7	1	0	0	1.225
8	5	1	2	8	2	8	0	1.208
8	5	1	2	9	2	8	1	0.733
8	5	1	2	10	1	0	0	0.678
8	5	1	3	1	1	0	0	0.797
8	5	1	3	2	1	0	2	3.323
8	5	1	3	3	1	0	0	2.317
8	5	1	3	4	1	0	1	1.492
8	5	2	1	1	4	29	0	0.136
8	5	2	1	2	1	0	0	2.441
8	5	2	1	3	2	8	1	1.491
8	5	2	1	4	1	0	1	2.958
8	5	2	1	5	2	8	0	0.819
8	5	2	1	6	1	0	0	0.878
8	5	2	1	7	1	0	1	0.827
8	5	2	1	8	1	0	0	1.614
8	5	2	1	9	1	0	2	2.322
8	5	2	1	10	1	0	2	1.999
8	5	2	1	11	1	0	0	2.554
8	5	2	2	1	1	0	0	2.638
8	5	2	2	2	1	0	1	2.623
8	5	2	2	3	1	0	1	0.819
8	5	2	2	4	1	0	1	1.291
8	5	2	2	5	1	0	0	1.355
8	5	2	2	6	1	0	0	1.990
8	5	2	2	7	1	0	0	0.917
8	5	2	2	8	1	0	0	0.679
8	5	2	2	9	1	0	0	0.814
8	5	2	2	10	2	8	0	0.211
8	5	2	2	11	1	0	0	0.405
8	5	2	2	12	1	0	0	1.392
8	5	2	2	13	1	0	0	0.444
8	5	2	2	14	1	0	0	0.521
8	5	2	2	15	2	8	0	0.224
8	5	2	2	16	1	0	0	1.442
8	5	2	2	17	1	0	0	0.385
8	5	2	2	18	1	0	0	0.092
8	5	2	2	19	1	0	0	0.660
8	5	2	2	20	1	0	0	0.179
8	5	2	3	1	1	0	0	0.673
8	5	2	3	2	1	0	0	0.495
8	5	2	3	3	1	0	0	1.048
8	5	2	3	4	1	0	0	0.499
8	5	2	3	5	1	0	2	1.101
8	5	2	3	6	2	8	0	0.293
8	5	2	3	7	1	0	0	0.706
8	5	2	3	8	1	0	0	0.797
8	5	2	3	9	1	0	0	0.975
8	5	2	3	10	1	0	0	0.499
8	5	2	3	11	1	0	0	1.042
8	5	2	3	12	1	0	0	0.695
8	5	2	3	13	1	0	0	0.971
8	5	2	3	14	1	0	0	0.511
8	5	2	3	15	1	0	0	0.545
8	5	2	3	16	1	0	0	0.433
8	5	2	3	17	1	0	0	0.271
8	5	2	3	18	1	0	0	0.815
8	5	2	3	19	1	0	0	0.539
8	5	2	3	20	1	0	2	0.816

Appendix 6 - Table 3

A - Species:
- 1 - *Agropyron dasystachyum*
- 2 - *Agropyron trachycaulum*
- 4 - *Festuca hallii*
- 5 - *Stipa comata*
- 6 - *Stipa curtiseta*
- 7 - *Stipa viridula*
- 8 - *Stipa viridula* (Lodorm)

B - Site along the topographic gradient (1 = ridge, 5 = toe of slope)

C - Moisture Treatment
- 1 - Control
- 2 - Previously irrigated (1989)

D - Replicate Number

E - Sample Number

F - Cohort Number (germination date)
- 1 - June 5, 1989
- 2 - June 13, 1989
- 3 - June 26, 1989
- 4 - July 4, 1989
- 5 - July 18, 1989
- 6 - July 26, 1989
- 7 - August 10, 1989
- 8 - August 19, 1989 (Survivorship)
- 8 - September 3, 1989 (Germination)
- 9 - May 17, 1990
- 9.5 - May 29, 1990
- 10 - July 26, 1990

G - Cohort Weighting (growing days after day 0 - June 5, 1989)

H - Number of Flowering Culms/Individual

I - Dry Weight (g)

Table 4. Soil texture data from individual samples.

A	B	C	D	E
1	1	1	7	17.83
1	2	1	10.44	26.59
1	3	1	21.82	55.58
1	1	2	7.86	20.16
1	2	2	9.15	23.21
1	3	2	22.09	56.62
1	1	3	7.39	18.58
1	2	3	9.2	23.11
1	3	3	23.21	58.32
2	1	1	7.36	18.45
2	2	1	9.29	23.3
2	3	1	23.23	58.25
2	1	2	7.08	17.69
2	2	2	8.89	22.21
2	3	2	24.05	60.1
2	1	3	7.34	18.37
2	2	3	8.75	21.88
2	3	3	23.89	59.76
3	1	1	7.99	20.11
3	2	1	8.94	22.49
3	3	1	22.81	57.41
3	1	2	7.82	19.65
3	2	2	8.64	21.72
3	3	2	23.33	58.63
3	1	3	8.88	22.59
3	2	3	8.57	21.81
3	3	3	21.86	55.6
4	1	1	8.65	21.81
4	2	1	12.35	31.16
4	3	1	18.64	47.03
4	1	2	8.64	22.06
4	2	2	11.85	30.26
4	3	2	18.67	47.68
4	1	3	8.43	21.46
4	2	3	11.66	29.68
4	3	3	19.2	48.86
5	1	1	8.53	21.61
5	2	1	7.65	19.38
5	3	1	23.29	59.01
5	1	2	5.96	15.17
5	2	2	6.17	15.72
5	3	2	27.14	69.11
5	1	3	6.11	15.71
5	2	3	5.97	15.35
5	3	3	26.82	68.95

A - Site along topographic gradient
(1=ridge, 5=toe of slope)

B - Soil Texture
1 - clay
2 - silt
3 - sand

C - Sample Number

D - Dry Weight (g)

E - Percentage composition

Table 5. Soil chemistry data from individual samples.

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1	1	7.55	7.1	0.2	25.05	3.85	14.09	2636	673	0	618	2.84	0.25	0.05	0.05
1	2	7.79	7.32	0.23	29.25	3.65	13.09	2978	664	5	578	3.03	0.26	0.07	0.24
2	1	6.94	6.43	0.17	30.8	4.71	11.34	1996	742	72	457	2.04	0.2	0.04	0
2	2	6.94	6.48	0.19	33.15	3.51	10.29	1959	434	12	440	1.96	0.18	0.05	0
3	1	7.19	6.69	0.16	22.85	4.33	8.74	2138	503	5	410	1.8	0.18	0.05	0
3	2	7.28	6.72	0.13	15.95	3.17	10.94	2085	461	10	473	1.85	0.18	0.04	0
4	1	6.89	6.41	0.2	25.4	5.9	7.84	2825	524	25	668	2.94	0.27	0.05	0
4	2	7.13	6.59	0.21	19.5	4.13	8.04	2894	534	55	526	2.73	0.24	0.05	0
5	1	8.02	7.61	0.86	12.45	5.35	3.83	4859	812	175	358	2.65	0.23	0.05	0.48
5	2	7.87	7.7	2.33	18.95	5.85	2.12	6495	850	616	383	3.39	0.23	0.05	1.22

Appendix 6 - Table 5

A - Site along the topographic gradient (1=ridge, 5=toe of slope)

B - Soil Sample number

C - pH (from H_2O solution)

D - pH (from $CaCl_2$ solution)

E - Electrical Conductivity (mS/cm)

F - NO_3 (µg/g)

G - NH_4 (µg/g)

H - PO_4 (µg/g)

I - Ca (µg/g)

J - Mg (µg/g)

K - Na (µg/g)

L - K (µg/g)

M - Total % Carbon

N - Total % Nitrogen

O - Total % Phosphorus

P - % Inorganic Carbon

Table 6. Soil strata moisture content from individual soil cores.

A	B	C	D	E	F	G	H	I	J	K
1	1	1	1	1	1	22.22	19.94	67.88	52.27	27.74
1	1	1	1	1	2	22.54	20.26	66.82	51.16	29.37
1	1	1	1	1	3	26.61	24.33	71.42	52.22	26.72
1	1	1	1	2	1	29.10	26.82	71.95	50.02	22.30
1	1	1	1	2	2	17.80	15.52	64.41	51.80	23.08
1	1	1	1	2	3	23.10	20.82	68.61	52.02	25.50
1	1	1	1	3	1	18.45	16.17	65.43	52.22	22.41
1	1	1	1	3	2	21.20	18.92	66.25	50.83	22.70
1	1	1	1	3	3	18.14	15.86	64.92	51.83	21.16
1	1	1	2	1	1	22.79	20.51	69.07	52.47	23.55
1	1	1	2	1	2	30.09	27.81	74.39	52.05	24.49
1	1	1	2	1	3	29.88	27.60	72.21	50.26	25.74
1	1	1	2	2	1	26.22	23.94	73.89	54.03	20.54
1	1	1	2	2	2	18.87	16.59	63.82	49.75	17.91
1	1	1	2	2	3	23.96	21.68	70.16	52.24	20.98
1	1	1	2	3	1	15.80	13.52	64.94	53.95	23.02
1	1	1	2	3	2	23.60	21.32	69.64	51.62	18.31
1	1	1	2	3	3	18.27	15.99	64.96	51.88	22.25
1	1	2	1	1	1	14.09	11.81	61.87	52.15	21.50
1	1	2	1	1	2	8.84	6.56	57.49	52.40	28.88
1	1	2	1	1	3	13.02	10.74	60.84	52.39	27.10
1	1	2	1	2	1	28.65	26.37	71.73	50.95	26.90
1	1	2	1	2	2	19.05	16.77	64.16	50.58	23.49
1	1	2	1	2	3	22.50	20.22	68.66	52.95	28.71
1	1	2	1	3	1	18.91	16.63	65.67	52.63	27.53
1	1	2	1	3	2	16.64	14.36	63.99	52.65	26.63
1	1	2	1	3	3	23.63	21.35	69.31	52.04	23.62
1	1	2	2	1	1	14.31	12.03	62.23	52.82	27.84
1	1	2	2	1	2	14.36	12.08	61.65	52.51	32.17
1	1	2	2	1	3	14.57	12.29	62.69	52.93	25.92
1	1	2	2	2	1	29.29	27.01	73.60	51.89	24.41
1	1	2	2	2	2	20.88	18.60	65.85	51.43	28.99
1	1	2	2	2	3	27.10	24.82	71.06	51.32	25.73
1	1	2	2	3	1	21.09	18.81	67.10	51.57	21.12
1	1	2	2	3	2	15.91	13.63	61.88	50.66	21.48
1	1	2	2	3	3	22.62	20.34	68.57	51.86	21.72
1	2	1	1	1	1	20.93	18.65	67.90	52.50	21.10
1	2	1	1	1	2	15.63	13.35	62.69	51.80	22.59
1	2	1	1	1	3	19.59	17.31	66.61	52.38	21.64
1	2	1	1	2	1	18.91	16.63	67.04	53.46	22.46
1	2	1	1	2	2	13.42	11.14	60.21	51.06	21.75
1	2	1	1	2	3	14.09	11.81	63.59	53.85	21.25
1	2	1	1	3	1	18.78	16.50	66.30	52.78	22.04
1	2	1	1	3	2	15.29	13.01	62.72	52.07	22.16
1	2	1	1	3	3	17.60	15.32	65.22	52.49	20.35
1	2	1	2	1	1	28.00	25.72	74.03	52.34	18.58
1	2	1	2	1	2	25.14	22.86	71.91	53.03	21.08
1	2	1	2	1	3	24.96	22.68	71.68	53.07	21.87
1	2	1	2	2	1	21.51	19.23	69.35	53.64	22.41
1	2	1	2	2	2	24.75	22.47	72.21	53.78	21.92
1	2	1	2	2	3	23.35	21.07	70.48	53.30	22.64
1	2	1	2	3	1	22.25	19.97	68.19	51.88	22.44
1	2	1	2	3	2	26.59	24.31	74.33	53.79	18.35
1	2	1	2	3	3	23.71	21.43	69.89	52.36	22.25
1	2	2	1	1	1	22.54	20.26	67.94	51.30	21.75
1	2	2	1	1	2	18.75	16.47	65.69	52.35	23.46
1	2	2	1	1	3	17.14	14.86	65.69	53.69	23.83
1	2	2	1	2	1	19.64	17.36	65.78	51.77	23.91
1	2	2	1	2	2	14.40	12.12	61.66	51.87	23.80
1	2	2	1	2	3	17.28	15.00	64.06	51.82	22.55
1	2	2	1	3	1	21.22	18.94	64.58	49.03	21.80
1	2	2	1	3	2	17.79	15.51	61.82	49.23	23.19
1	2	2	1	3	3	16.42	14.14	59.12	47.63	23.06
1	2	2	2	1	1	26.45	24.17	70.78	50.39	18.54
1	2	2	2	1	2	27.71	25.43	73.52	52.11	18.78
1	2	2	2	1	3	24.53	22.25	70.06	51.81	21.92
1	2	2	2	2	1	26.13	23.85	67.91	48.27	21.44
1	2	2	2	2	2	24.54	22.26	66.16	48.21	24.01
1	2	2	2	2	3	26.71	24.43	68.59	48.17	19.64
1	2	2	2	3	1	23.82	21.54	66.47	48.37	22.39
1	2	2	2	3	2	25.43	23.15	67.38	48.54	22.88
1	2	2	2	3	3	23.94	21.66	65.11	47.58	23.56
1	3	1	1	1	1	20.74	18.46	63.12	47.83	20.73
1	3	1	1	1	2	18.96	16.68	61.13	47.14	19.23
1	3	1	1	1	3	15.39	13.11	58.78	47.94	20.94
1	3	1	1	2	1	14.41	12.13	58.60	48.46	19.63
1	3	1	1	2	2	13.06	10.78	57.49	48.32	17.56
1	3	1	1	2	3	16.25	13.97	60.16	48.49	19.71
1	3	1	1	3	1	14.86	12.58	58.21	47.53	17.79
1	3	1	1	3	2	14.10	11.82	58.08	47.98	17.03
1	3	1	1	3	3	16.68	14.40	60.02	48.03	20.10
1	3	1	2	1	1	26.90	24.62	68.67	47.01	13.57
1	3	1	2	1	2	25.63	23.35	68.70	48.69	16.69
1	3	1	2	1	3	25.96	23.68	68.00	48.11	19.05
1	3	1	2	2	1	23.47	21.19	64.46	47.03	21.57
1	3	1	2	2	2	26.80	24.52	69.72	49.11	18.97
1	3	1	2	2	3	23.09	20.81	66.04	48.79	20.64
1	3	1	2	3	1	25.67	23.39	67.68	47.44	15.56
1	3	1	2	3	2	25.11	22.83	67.40	47.95	17.38
1	3	1	2	3	3	26.96	24.68	70.31	49.76	20.10
1	3	2	1	1	1	8.87	6.59	52.78	47.48	24.34
1	3	2	1	1	2	13.52	11.24	58.34	49.16	22.44
1	3	2	1	2	1	17.14	14.86	61.53	49.27	21.21
1	3	2	1	2	2	14.06	11.78	58.42	48.72	21.44
1	3	2	1	2	3	12.57	10.29	57.56	48.99	20.07
1	3	2	1	3	1	13.99	11.71	57.41	47.74	21.10
1	3	2	1	3	2	13.41	11.13	57.19	47.72	17.53
1	3	2	1	3	3	12.69	10.41	56.15	47.52	20.63
1	3	2	2	1	1	25.72	23.44	66.24	47.34	24.02
1	3	2	2	1	2	22.29	20.01	64.73	48.54	23.59
1	3	2	2	1	3	24.36	22.08	65.79	47.78	22.60
1	3	2	2	2	1	23.64	21.36	65.46	48.73	27.67
1	3	2	2	2	2	24.14	21.86	65.44	47.33	20.71
1	3	2	2	2	3	28.17	25.89	69.54	47.77	18.93
1	3	2	2	3	1	26.15	23.87	67.46	47.86	21.79
1	3	2	2	3	2	22.56	20.28	65.95	49.00	19.65
1	3	2	2	3	3	25.11	22.83	67.15	48.35	21.44
1	4	1	1	1	1	16.70	14.42	60.14	48.98	29.21
1	4	1	1	1	2	11.43	9.15	55.29	48.10	27.26
1	4	1	1	1	3	9.80	7.52	54.14	48.22	27.03
1	4	1	1	2	1	16.06	13.78	59.12	48.29	27.24
1	4	1	1	2	2	17.74	15.46	59.71	47.59	27.56
1	4	1	1	2	3	14.13	11.85	57.67	48.30	26.47
1	4	1	1	3	1	11.61	9.33	38.06	30.60	25.07
1	4	1	1	3	2	14.63	12.35	39.93	29.99	24.25
1	4	1	1	3	3	17.05	14.77	41.35	29.51	24.75
1	4	1	2	1	1	24.01	21.73	64.91	48.29	30.75
1	4	1	2	1	2	22.27	19.99	63.30	48.00	30.65
1	4	1	2	1	3	22.00	19.72	64.29	49.05	29.40
1	4	1	2	2	1	23.30	21.02	64.50	48.20	28.96
1	4	1	2	2	2	23.25	20.97	46.84	30.65	29.52
1	4	1	2	2	3	23.28	21.00	46.19	29.92	29.07
1	4	1	2	3	1	22.44	20.16	45.73	30.04	28.49
1	4	1	2	3	2	22.76	20.48	45.71	29.50	26.34

A	B	C	D	E	F	G	H	I	J	K
1	4	1	2	3	3	24.39	22.11	47.25	29.42	24.00
1	4	2	1	1	1	15.64	13.36	62.59	52.27	29.46
1	4	2	1	1	2	12.15	9.87	58.84	51.16	28.52
1	4	2	1	1	3	18.54	16.26	65.05	52.22	26.73
1	4	2	1	2	1	15.57	13.29	60.65	50.02	25.02
1	4	2	1	2	2	13.43	11.15	60.89	52.02	25.70
1	4	2	1	2	3	13.26	10.98	60.44	51.80	27.08
1	4	2	1	3	1	11.12	8.84	59.33	52.22	24.33
1	4	2	1	3	2	17.82	15.54	63.20	50.83	25.63
1	4	2	1	3	3	15.50	13.22	62.38	51.83	25.31
1	4	2	2	1	1	22.31	20.03	67.84	52.47	30.32
1	4	2	2	1	2	21.77	19.49	67.00	52.05	30.37
1	4	2	2	1	3	25.01	22.73	68.18	50.26	26.84
1	4	2	2	2	1	23.63	21.35	70.71	54.03	28.00
1	4	2	2	2	2	22.76	20.48	65.78	49.75	27.76
1	4	2	2	2	3	22.23	19.95	67.68	52.24	29.21
1	4	2	2	3	1	23.98	21.70	71.65	53.95	22.60
1	4	2	2	3	2	25.27	22.99	70.66	51.62	20.75
1	4	2	2	3	3	22.87	20.59	68.41	51.88	24.56
1	5	1	1	1	1	11.45	9.17	60.00	52.15	16.82
1	5	1	1	1	2	13.08	10.80	61.38	52.40	20.27
1	5	1	1	1	3	15.93	13.65	63.55	52.39	22.31
1	5	1	1	2	2	18.62	16.34	64.32	50.58	18.92
1	5	1	1	2	3	11.75	9.47	60.92	52.95	18.82
1	5	1	1	3	1	16.47	14.19	64.73	52.63	17.27
1	5	1	1	3	2	11.09	8.81	60.08	52.65	18.57
1	5	1	1	3	3	11.85	9.57	60.14	52.04	18.15
1	5	1	2	1	1	21.75	19.47	68.07	52.82	27.67
1	5	1	2	1	2	24.38	22.10	70.67	52.51	21.70
1	5	1	2	1	3	23.61	21.33	70.39	52.93	22.16
1	5	1	2	2	1	22.54	20.26	68.70	51.89	20.52
1	5	1	2	2	2	25.14	22.86	70.00	51.43	23.10
1	5	1	2	2	3	20.12	17.84	65.33	51.32	27.34
1	5	1	2	3	1	25.04	22.76	70.79	51.57	18.42
1	5	1	2	3	2	22.59	20.31	67.25	50.66	22.42
1	5	1	2	3	3	16.91	14.63	63.41	51.86	26.67
1	5	2	1	1	1	10.07	7.79	58.91	52.50	21.53
1	5	2	1	1	2	18.05	15.77	64.63	51.80	22.92
1	5	2	1	1	3	13.28	11.00	61.17	52.38	25.14
1	5	2	1	2	1	10.36	8.08	60.03	53.46	22.98
1	5	2	1	2	2	18.80	16.52	64.43	51.06	23.56
1	5	2	1	2	3	17.07	14.79	65.97	53.85	22.03
1	5	2	1	3	1	11.70	9.42	60.77	52.78	17.90
1	5	2	1	3	2	14.27	11.99	61.96	52.07	21.23
1	5	2	1	3	3	17.24	14.96	65.19	52.49	17.80
1	5	2	2	1	1	24.14	21.86	70.76	52.34	18.68
1	5	2	2	1	2	24.70	22.42	71.94	53.03	18.56
1	5	2	2	1	3	25.80	23.52	72.90	53.07	18.61
1	5	2	2	2	1	22.83	20.55	70.06	53.64	25.15
1	5	2	2	2	2	23.80	21.52	71.47	53.78	21.65
1	5	2	2	2	3	22.37	20.09	69.50	53.30	24.01
1	5	2	2	3	1	19.38	17.10	65.66	51.88	24.09
1	5	2	2	3	2	21.78	19.50	68.84	53.79	29.57
1	5	2	2	3	3	24.04	21.76	69.94	52.36	23.78
3	1	1	1	1	1	16.10	13.82	63.11	51.30	17.02
3	1	1	1	1	2	23.09	20.81	69.78	52.35	19.39
3	1	1	1	1	3	19.55	17.27	68.39	53.69	17.48
3	1	1	1	2	1	22.88	20.60	69.44	51.77	16.58
3	1	1	1	2	2	19.71	17.43	66.84	51.87	16.43
3	1	1	1	2	3	17.16	14.88	65.30	51.82	10.39
3	1	1	1	3	1	19.93	17.65	64.24	49.03	16.04
3	1	1	1	3	2	18.44	16.16	63.21	49.23	15.59
3	1	1	1	3	3	12.90	10.62	57.09	47.63	12.26
3	1	1	2	1	1	19.74	17.46	64.78	50.39	21.33
3	1	1	2	1	2	28.95	26.67	74.12	52.11	21.17
3	1	1	2	1	3	20.14	17.86	66.47	51.81	21.83
3	1	1	2	2	1	28.60	26.32	70.11	48.27	20.51
3	1	1	2	2	2	21.73	19.45	64.47	48.21	19.62
3	1	1	2	2	3	18.39	16.11	62.27	48.17	14.26
3	1	1	2	3	1	25.16	22.88	68.89	48.87	14.29
3	1	1	2	3	2	20.16	17.88	63.43	48.54	20.08
3	1	1	2	3	3	16.38	14.10	60.02	47.58	13.34
3	1	2	1	1	1	11.81	9.53	55.92	47.83	17.80
3	1	2	1	1	2	16.63	14.35	59.26	47.14	18.40
3	1	2	1	1	3	16.41	14.13	60.07	47.94	16.49
3	1	2	1	2	1	20.08	17.80	63.92	48.46	15.14
3	1	2	1	2	2	16.59	14.31	60.61	48.32	16.44
3	1	2	1	2	3	19.68	17.40	63.20	48.49	18.29
3	1	2	1	3	1	17.46	15.18	60.77	47.53	14.65
3	1	2	1	3	2	18.07	15.79	61.82	47.98	14.09
3	1	2	1	3	3	15.70	13.42	59.83	48.03	13.73
3	1	2	2	1	1	14.69	12.41	57.42	47.01	19.21
3	1	2	2	1	2	17.02	14.74	60.62	48.69	23.55
3	1	2	2	1	3	16.27	13.99	59.55	48.11	22.29
3	1	2	2	2	1	25.38	23.10	66.65	47.03	17.74
3	1	2	2	2	2	18.37	16.09	62.37	49.11	21.34
3	1	2	2	2	3	23.84	21.56	66.42	48.79	22.29
3	1	2	2	3	1	20.45	18.17	62.70	47.44	19.07
3	1	2	2	3	2	16.86	14.58	60.12	47.95	19.80
3	1	2	2	3	3	16.51	14.23	62.49	49.76	11.78
3	2	1	1	1	1	20.76	18.48	63.31	47.48	16.74
3	2	1	1	1	2	17.40	15.12	62.40	49.16	14.20
3	2	1	1	1	3	14.50	12.22	59.84	49.27	15.61
3	2	1	1	2	1	16.92	14.64	62.07	49.27	14.38
3	2	1	1	2	2	14.68	12.40	59.51	48.72	14.92
3	2	1	1	2	3	16.05	13.77	60.97	48.99	14.94
3	2	1	1	3	1	20.22	17.94	63.33	47.74	15.07
3	2	1	1	3	2	15.31	13.03	59.28	47.72	12.72
3	2	1	1	3	3	15.93	13.65	59.61	47.52	12.90
3	2	1	2	1	1	25.51	23.23	67.09	47.34	17.62
3	2	1	2	1	2	24.13	21.85	66.86	48.54	19.27
3	2	1	2	1	3	23.76	21.48	65.65	47.78	20.20
3	2	1	2	2	1	21.75	19.47	64.75	48.73	21.54
3	2	1	2	2	2	21.06	18.78	63.07	47.33	19.31
3	2	1	2	2	3	25.41	23.13	67.11	47.77	19.60
3	2	1	2	3	1	32.24	29.96	73.45	47.86	17.08
3	2	1	2	3	2	24.59	22.31	67.82	49.00	18.54
3	2	1	2	3	3	22.66	20.38	65.91	48.35	16.06
3	2	2	1	1	1	15.75	13.47	60.77	48.98	14.25
3	2	2	1	1	2	13.86	11.58	58.18	48.10	14.88
3	2	2	1	1	3	18.51	16.23	62.26	48.22	15.60
3	2	2	1	2	1	16.64	14.36	60.66	48.29	16.09
3	2	2	1	2	2	17.86	15.58	61.01	47.59	16.10
3	2	2	1	2	3	19.43	17.15	63.05	48.30	16.27
3	2	2	1	3	1	11.56	9.28	38.75	30.60	13.87
3	2	2	1	3	2	14.28	12.00	40.53	29.99	13.85
3	2	2	1	3	3	13.71	11.43	39.49	29.51	14.53
3	2	2	2	1	1	24.13	21.85	66.62	48.29	19.20
3	2	2	2	1	2	25.79	23.51	67.70	48.00	19.34
3	2	2	2	1	3	24.98	22.70	68.05	49.05	19.47
3	2	2	2	2	1	25.06	22.78	67.19	48.20	19.96
3	2	2	2	2	2	25.69	23.41	50.85	30.65	15.89
3	2	2	2	2	3	25.91	23.63	50.17	29.92	16.69
3	2	2	2	3	1	25.28	23.00	49.36	30.04	19.05
3	2	2	2	3	2	22.71	20.43	46.50	29.50	20.18
3	2	2	2	3	3	24.88	22.60	48.36	29.42	19.32
3	3	1	1	1	1	15.52	13.24	64.13	52.27	11.64
3	3	1	1	1	2	13.89	11.61	61.36	51.16	13.82
3	3	1	1	1	3	18.14	15.86	66.06	52.22	14.60
3	3	1	1	2	1	15.08	12.80	61.68	50.02	9.78
3	3	1	1	2	2	13.19	10.91	61.68	51.80	10.43
3	3	1	1	2	3	14.98	12.70	63.45	52.02	11.11
3	3	1	1	3	1	16.48	14.20	64.95	52.22	11.55
3	3	1	1	3	2	12.88	10.60	60.56	50.83	8.94
3	3	1	1	3	3	12.81	10.53	61.40	51.83	10.03
3	3	1	2	1	1	25.96	23.68	72.72	52.47	16.94
3	3	1	2	1	2	26.63	24.35	72.49	52.05	19.13
3	3	1	2	1	3	26.05	23.77	71.27	50.26	13.14
3	3	1	2	2	1	25.94	23.66	74.23	54.03	17.13
3	3	1	2	2	2	22.29	20.01	66.61	49.75	18.68
3	3	1	2	2	3	24.93	22.65	71.53	52.24	17.42
3	3	1	2	3	1	25.90	23.62	74.49	53.95	15.00
3	3	1	2	3	2	24.13	21.85	70.43	51.62	16.16
3	3	1	2	3	3	23.39	21.11	69.99	51.88	16.57
3	3	2	1	1	1	14.91	12.63	63.52	52.15	11.08
3	3	2	1	1	2	15.35	13.07	63.82	52.40	14.45
3	3	2	1	1	3	17.30	15.02	65.35	52.39	15.90
3	3	2	1	2	1	13.77	11.49	61.21	50.95	11.99
3	3	2	1	2	2	10.89	8.61	58.33	50.58	11.10
3	3	2	1	2	3	15.21	12.93	64.48	52.95	12.14
3	3	2	1	3	1	12.57	10.29	61.85	52.63	11.61
3	3	2	1	3	2	13.56	11.28	62.80	52.65	11.13
3	3	2	1	3	3	12.83	10.55	61.46	52.04	12.00
3	3	2	2	1	1	24.03	21.75	70.88	52.82	20.43
3	3	2	2	1	2	24.33	22.05	70.82	52.51	20.43
3	3	2	2	1	3	24.30	22.02	71.21	52.93	20.46
3	3	2	2	2	1	25.41	23.13	71.92	51.89	15.48
3	3	2	2	2	2	25.80	23.52	71.67	51.43	16.21
3	3	2	2	2	3	25.87	23.59	71.32	51.32	17.95
3	3	2	2	3	1	27.09	24.81	72.86	51.57	16.53
3	3	2	2	3	2	25.73	23.45	70.72	50.66	16.90
3	3	2	2	3	3	24.06	21.78	70.32	51.86	17.98

A	B	C	D	E	F	G	H	I	J	K
3	4	1	1	1	1	11.30	9.02	60.31	52.50	15.49
3	4	1	1	1	2	15.12	12.84	62.63	51.80	18.56
3	4	1	1	1	3	14.79	12.51	62.90	52.38	18.92
3	4	1	1	2	1	11.55	9.27	61.59	53.46	14.02
3	4	1	1	2	2	14.73	12.45	61.57	51.06	18.46
3	4	1	1	2	3	9.62	7.34	60.28	53.85	14.15
3	4	1	1	3	1	12.70	10.42	61.74	52.78	16.29
3	4	1	1	3	2	16.21	13.93	63.92	52.07	17.55
3	4	1	1	3	3	10.29	8.01	59.48	52.49	14.59
3	4	1	2	1	1	19.64	17.36	66.09	52.34	26.25
3	4	1	2	1	2	21.34	19.06	68.02	53.03	27.15
3	4	1	2	1	3	21.99	19.71	68.59	53.07	27.00
3	4	1	2	2	1	20.85	18.57	68.38	53.64	25.98
3	4	1	2	2	2	22.34	20.06	69.67	53.78	26.24
3	4	1	2	2	3	21.18	18.90	68.44	53.30	24.83
3	4	1	2	3	1	22.91	20.63	68.66	51.88	22.94
3	4	1	2	3	2	23.15	20.87	70.52	53.79	24.75
3	4	1	2	3	3	23.19	20.91	69.21	52.36	24.09
3	4	2	1	1	1	16.79	14.51	63.54	51.30	18.55
3	4	2	1	1	2	11.02	8.74	60.00	52.35	14.25
3	4	2	1	1	3	14.71	12.43	64.30	53.69	17.15
3	4	2	1	2	1	11.68	9.40	59.85	51.77	16.34
3	4	2	1	2	2	12.24	9.96	60.57	51.87	14.48
3	4	2	1	2	3	12.64	10.36	60.85	51.82	14.73
3	4	2	1	3	1	13.54	11.26	58.83	49.03	14.90
3	4	2	1	3	2	14.29	12.01	59.65	49.23	15.26
3	4	2	1	3	3	15.99	13.71	59.26	47.63	17.88
3	4	2	2	1	1	23.84	21.56	67.76	50.39	24.12
3	4	2	2	1	2	22.04	19.76	67.84	52.11	25.62
3	4	2	2	1	3	23.05	20.77	68.17	51.81	26.96
3	4	2	2	2	1	19.85	17.57	62.35	48.27	24.79
3	4	2	2	2	2	21.83	19.55	63.71	48.21	26.13
3	4	2	2	2	3	23.99	21.71	65.61	48.17	24.48
3	4	2	2	3	1	24.40	22.12	67.16	48.87	20.94
3	4	2	2	3	2	24.28	22.00	66.63	48.54	21.61
3	4	2	2	3	3	24.55	22.27	65.83	47.58	22.03
3	5	1	1	1	1	13.42	11.14	57.89	47.83	10.74
3	5	1	1	1	2	17.90	15.62	60.70	47.14	15.19
3	5	1	1	1	3	15.26	12.98	59.23	47.94	14.97
3	5	1	1	2	1	11.67	9.39	56.75	48.46	13.27
3	5	1	1	2	2	16.06	13.78	60.52	48.32	12.95
3	5	1	1	2	3	13.37	11.09	58.67	48.49	8.94
3	5	1	1	3	1	17.41	15.13	60.80	47.53	14.02
3	5	1	1	3	2	15.88	13.60	59.97	47.98	13.43
3	5	1	1	3	3	19.83	17.55	63.29	48.03	15.01
3	5	1	2	1	1	24.62	22.34	65.98	47.01	17.76
3	5	1	2	1	2	24.01	21.73	66.63	48.69	21.13
3	5	1	2	1	3	23.35	21.07	65.87	48.11	18.64
3	5	1	2	2	1	19.57	17.29	61.26	47.03	21.50
3	5	1	2	2	2	22.03	19.75	65.70	49.11	19.05
3	5	1	2	2	3	22.18	19.90	65.70	48.79	17.68
3	5	1	2	3	1	28.37	26.09	69.75	47.44	16.94
3	5	1	2	3	2	24.34	22.06	66.53	47.95	18.73
3	5	1	2	3	3	27.09	24.81	70.89	49.76	17.42
3	5	2	1	1	1	15.33	13.05	58.57	47.48	17.67
3	5	2	1	1	2	11.50	9.22	57.31	49.16	13.13
3	5	2	1	1	3	13.49	11.21	59.04	49.27	14.74
3	5	2	1	2	1	11.55	9.27	57.44	49.27	13.46
3	5	2	1	2	2	16.04	13.76	60.48	48.72	17.01
3	5	2	1	2	3	11.83	9.55	57.07	48.99	18.19
3	5	2	1	3	1	13.04	10.76	57.20	47.74	13.74
3	5	2	1	3	2	11.39	9.11	55.72	47.72	13.88
3	5	2	1	3	3	15.33	13.05	58.71	47.52	16.62
3	5	2	2	1	1	27.62	25.34	69.44	47.34	14.66
3	5	2	2	1	2	21.82	19.54	65.30	48.54	16.59
3	5	2	2	1	3	25.73	23.45	67.50	47.78	18.91
3	5	2	2	2	1	23.26	20.98	66.08	48.73	20.92
3	5	2	2	2	2	23.31	21.03	64.64	47.33	21.49
3	5	2	2	2	3	22.24	19.96	64.17	47.77	21.71
3	5	2	2	3	1	22.83	20.55	65.17	47.86	18.72
3	5	2	2	3	2	19.64	17.36	63.49	49.00	19.81
3	5	2	2	3	3	25.82	23.54	68.10	48.35	19.19
5	1	1	1	1	1	15.62	13.34	63.97	52.27	14.02
5	1	1	1	1	2	20.29	18.01	67.32	51.16	11.45
5	1	1	1	1	3	17.70	15.42	65.63	52.22	14.99
5	1	1	1	2	1	27.88	25.60	72.68	50.02	12.97
5	1	1	1	2	2	20.42	18.14	68.23	51.80	10.41
5	1	1	1	2	3	15.59	13.31	63.85	52.02	12.51
5	1	1	1	3	1	16.22	13.94	65.14	52.22	7.89
5	1	1	1	3	2	26.44	24.16	72.56	50.83	11.18
5	1	1	1	3	3	15.31	13.03	63.85	51.83	8.40

A	B	C	D	E	F	G	H	I	J	K
5	1	1	2	1	1	24.69	22.41	71.11	52.47	20.25
5	1	1	2	1	2	20.87	18.59	67.75	52.05	18.41
5	1	1	2	1	3	20.47	18.19	65.48	50.26	19.51
5	1	1	2	2	1	26.34	24.06	74.65	54.03	16.68
5	1	1	2	2	2	18.72	16.44	63.89	49.75	16.27
5	1	1	2	2	3	16.55	14.27	64.38	52.24	17.55
5	1	1	2	3	1	12.17	9.89	62.51	53.95	15.54
5	1	1	2	3	2	22.66	20.38	69.50	51.62	13.98
5	1	1	2	3	3	14.71	12.43	62.51	51.88	16.93
5	1	2	1	1	1	19.58	17.30	67.28	52.15	14.34
5	1	2	1	1	2	20.68	18.40	68.51	52.40	14.21
5	1	2	1	1	3	16.64	14.36	65.06	52.39	13.34
5	1	2	1	2	1	19.54	17.26	66.12	50.95	13.78
5	1	2	1	2	2	14.01	11.73	60.91	50.58	13.55
5	1	2	1	2	3	21.49	19.21	69.74	52.95	14.41
5	1	2	1	3	1	17.40	15.12	66.12	52.63	12.08
5	1	2	1	3	2	20.29	18.01	68.50	52.65	13.63
5	1	2	1	3	3	18.51	16.23	66.68	52.04	10.86
5	1	2	2	1	1	22.67	20.39	69.82	52.82	19.94
5	1	2	2	1	2	21.30	19.02	68.33	52.51	20.23
5	1	2	2	1	3	18.54	16.26	66.65	52.93	18.51
5	1	2	2	2	1	17.33	15.05	64.44	51.89	19.92
5	1	2	2	2	2	15.48	13.20	63.08	51.43	13.30
5	1	2	2	2	3	25.28	23.00	70.56	51.32	19.54
5	1	2	2	3	1	20.96	18.68	67.41	51.57	17.93
5	1	2	2	3	2	25.19	22.91	70.22	50.66	17.13
5	1	2	2	3	3	17.48	15.20	65.35	51.86	12.68
5	2	1	1	1	1	15.06	12.78	63.91	52.50	12.01
5	2	1	1	1	2	17.46	15.18	65.45	51.80	11.21
5	2	1	1	1	3	16.52	14.24	65.05	52.38	12.39
5	2	1	1	2	1	19.97	17.69	69.14	53.46	12.82
5	2	1	1	2	2	14.25	11.97	61.79	51.06	11.56
5	2	1	1	2	3	13.10	10.82	63.66	53.85	10.30
5	2	1	1	3	1	15.41	13.13	64.66	52.78	10.52
5	2	1	1	3	2	13.29	11.01	62.13	52.07	9.44
5	2	1	1	3	3	14.58	12.30	63.53	52.49	11.41
5	2	1	2	1	1	25.94	23.66	72.77	52.34	15.81
5	2	1	2	1	2	25.86	23.58	73.26	53.03	16.56
5	2	1	2	1	3	25.11	22.83	73.08	53.07	14.09
5	2	1	2	2	1	21.59	19.31	70.02	53.64	17.89
5	2	1	2	2	2	22.15	19.87	70.78	53.78	16.88
5	2	1	2	2	3	23.21	20.93	71.32	53.30	16.15
5	2	1	2	3	1	23.59	21.31	70.28	51.88	15.82
5	2	1	2	3	2	24.44	22.16	72.72	53.79	17.06
5	2	1	2	3	3	24.42	22.14	71.26	52.36	17.14
5	2	2	1	1	1	18.45	16.17	65.52	51.30	13.71
5	2	2	1	1	2	14.20	11.92	62.87	52.35	13.31
5	2	2	1	1	3	21.29	19.01	70.20	53.69	15.14
5	2	2	1	2	1	19.56	17.28	66.96	51.77	13.76
5	2	2	1	2	2	16.85	14.57	64.82	51.87	12.51
5	2	2	1	2	3	20.93	18.65	68.06	51.82	14.84
5	2	2	1	3	1	13.77	11.49	59.26	49.03	12.32
5	2	2	1	3	2	13.41	11.13	59.23	49.23	11.30
5	2	2	1	3	3	14.55	12.27	58.57	47.63	12.16
5	2	2	2	1	1	23.71	21.43	68.64	50.39	17.42
5	2	2	2	1	2	21.57	19.29	68.23	52.11	19.67
5	2	2	2	1	3	25.18	22.90	71.41	51.31	16.34
5	2	2	2	2	1	28.38	26.10	70.99	48.27	14.88
5	2	2	2	2	2	24.22	21.94	67.03	48.21	16.58
5	2	2	2	2	3	26.08	23.80	68.88	48.17	14.92
5	2	2	2	3	1	22.45	20.17	66.58	48.87	13.89
5	2	2	2	3	2	23.24	20.96	66.41	48.54	17.29
5	2	2	2	3	3	19.43	17.15	62.32	47.58	16.35
5	3	1	1	1	1	16.94	14.66	61.23	47.83	9.40
5	3	1	1	1	2	17.17	14.89	60.03	47.14	15.52
5	3	1	1	1	3	15.82	13.54	60.62	47.94	6.78
5	3	1	1	2	1	16.76	14.48	61.76	48.46	8.87
5	3	1	1	2	2	16.39	14.11	61.21	48.32	9.46
5	3	1	1	2	3	14.74	12.46	59.77	48.49	10.46
5	3	1	1	3	1	14.32	12.04	58.67	47.53	8.08
5	3	1	1	3	2	16.93	14.65	61.25	47.98	10.40
5	3	1	1	3	3	12.76	10.48	57.98	48.03	5.33
5	3	1	2	1	1	24.83	22.55	67.62	48.11	15.58
5	3	1	2	1	2	24.52	22.24	67.89	48.69	15.83
5	3	1	2	1	3	23.48	21.20	64.87	47.01	18.70
5	3	1	2	2	1	22.24	19.96	64.38	47.03	15.04
5	3	1	2	2	2	23.04	20.76	66.98	49.11	16.17
5	3	1	2	2	3	23.59	21.31	67.09	48.79	16.45
5	3	1	2	3	1	27.26	24.98	68.95	47.44	16.13
5	3	1	2	3	2	24.66	22.38	67.50	47.95	14.48
5	3	1	2	3	3	21.42	19.14	66.19	49.76	16.49

A	B	C	D	E	F	G	H	I	J	K
5	3	2	1	1	1	14.06	11.78	58.10	47.48	10.92
5	3	2	1	1	2	11.61	9.33	58.00	49.16	5.54
5	3	2	1	1	3	12.61	10.33	58.60	49.27	10.72
5	3	2	1	2	1	14.03	11.75	59.94	49.27	10.12
5	3	2	1	2	2	13.56	11.28	58.88	48.72	11.02
5	3	2	1	2	3	16.54	14.26	61.63	48.99	12.82
5	3	2	1	3	1	16.19	13.91	60.37	47.74	10.13
5	3	2	1	3	2	12.29	10.01	56.93	47.72	8.69
5	3	2	1	3	3	14.81	12.53	58.78	47.52	11.28
5	3	2	2	1	1	21.14	18.86	63.22	47.34	18.77
5	3	2	2	1	2	23.76	21.48	66.53	48.54	19.40
5	3	2	2	1	3	22.91	20.63	65.09	47.78	19.18
5	3	2	2	2	1	21.61	19.33	65.00	48.73	18.81
5	3	2	2	2	2	24.83	22.55	66.55	47.33	17.33
5	3	2	2	2	3	24.53	22.25	67.07	47.77	15.28
5	3	2	2	3	1	24.06	21.78	66.64	47.86	15.97
5	3	2	2	3	2	22.40	20.12	66.11	49.00	17.59
5	3	2	2	3	3	23.27	20.99	66.21	48.35	17.53
5	4	1	1	1	1	14.37	12.09	59.53	48.98	14.60
5	4	1	1	1	2	15.22	12.94	59.40	48.10	14.51
5	4	1	1	1	3	11.41	9.13	56.47	48.22	10.67
5	4	1	1	2	1	12.39	10.11	57.29	48.29	12.33
5	4	1	1	2	2	15.88	13.60	59.56	47.59	13.62
5	4	1	1	2	3	13.36	11.08	58.20	48.30	11.92
5	4	1	1	3	1	13.12	10.84	40.28	30.60	11.98
5	4	1	1	3	2	15.43	13.15	41.55	29.99	13.75
5	4	1	1	3	3	14.08	11.80	40.36	29.51	8.76
5	4	1	2	1	1	23.39	21.11	65.21	48.29	24.76
5	4	1	2	1	2	21.48	19.20	63.26	48.00	25.82
5	4	1	2	1	3	19.97	17.69	63.36	49.05	23.62
5	4	1	2	2	1	21.94	19.66	64.02	48.20	24.27
5	4	1	2	2	2	19.96	17.68	44.99	30.65	23.29
5	4	1	2	2	3	22.02	19.74	45.94	29.92	23.22
5	4	1	2	3	1	23.07	20.79	47.29	30.04	20.52
5	4	1	2	3	2	23.20	20.92	46.54	29.50	22.77
5	4	1	2	3	3	23.68	21.40	46.86	29.42	22.71
5	4	2	1	1	1	12.15	9.87	60.73	52.27	16.67
5	4	2	1	1	2	11.38	9.10	59.13	51.16	14.18
5	4	2	1	1	3	14.01	11.73	62.29	52.22	16.48
5	4	2	1	2	1	14.44	12.16	60.77	50.02	13.12
5	4	2	1	2	2	13.40	11.12	61.53	51.80	14.29
5	4	2	1	2	3	11.36	9.08	59.97	52.02	14.21
5	4	2	1	3	1	16.90	14.62	65.10	52.22	13.51
5	4	2	1	3	2	17.22	14.94	63.89	50.83	14.40
5	4	2	1	3	3	14.48	12.20	62.29	51.83	16.63
5	4	2	2	1	1	23.27	20.99	69.55	52.47	22.89
5	4	2	2	1	2	18.51	16.23	62.77	49.75	24.65
5	4	2	2	1	3	21.02	18.74	65.01	50.26	27.05
5	4	2	2	2	1	23.06	20.78	70.96	54.03	22.74
5	4	2	2	2	2	25.52	23.24	71.71	52.05	18.21
5	4	2	2	2	3	23.59	21.31	69.35	52.24	24.55
5	4	2	2	3	1	24.85	22.57	73.58	53.95	14.98
5	4	2	2	3	2	27.16	24.88	72.38	51.62	19.85
5	4	2	2	3	3	23.63	21.35	68.93	51.88	25.22
5	5	1	1	1	1	15.48	13.20	64.19	52.15	9.63
5	5	1	1	1	2	17.57	15.29	66.22	52.40	10.64
5	5	1	1	1	3	15.46	13.18	64.58	52.39	8.12
5	5	1	1	2	1	14.89	12.61	62.00	50.95	14.12
5	5	1	1	2	2	15.12	12.84	62.09	50.58	11.56
5	5	1	1	2	3	13.23	10.95	62.89	52.95	10.16
5	5	1	1	3	1	14.86	12.58	64.09	52.63	9.77
5	5	1	1	3	2	16.06	13.78	65.16	52.65	10.15
5	5	1	1	3	3	19.06	16.78	67.26	52.04	10.25
5	5	1	2	1	1	24.51	22.23	71.18	52.82	21.08
5	5	1	2	1	2	27.87	25.59	74.69	52.51	15.37
5	5	1	2	1	3	23.93	21.65	71.50	52.93	16.59
5	5	1	2	2	1	24.03	21.75	70.35	51.89	17.82
5	5	1	2	2	2	29.62	27.34	74.58	51.43	18.10
5	5	1	2	2	3	23.26	20.98	69.08	51.32	18.13
5	5	1	2	3	1	23.01	20.73	69.14	51.57	17.99
5	5	1	2	3	2	22.47	20.19	67.57	50.66	19.40
5	5	1	2	3	3	20.53	18.25	66.99	51.86	20.62
5	5	2	1	1	1	18.21	15.93	66.29	52.50	15.52
5	5	2	1	1	2	14.53	12.25	62.84	51.80	10.96
5	5	2	1	1	3	11.60	9.32	61.03	52.38	7.75
5	5	2	1	2	1	14.22	11.94	64.01	53.46	13.18
5	5	2	1	2	2	20.85	18.57	67.30	51.06	14.35
5	5	2	1	2	3	11.87	9.59	62.55	53.85	10.23
5	5	2	1	3	1	13.35	11.07	62.77	52.78	10.81
5	5	2	1	3	2	19.26	16.98	66.89	52.07	14.57
5	5	2	1	3	3	11.55	9.27	60.89	52.49	10.36

A	B	C	D	E	F	G	H	I	J	K
5	5	2	2	1	1	26.97	24.69	73.96	52.34	14.20
5	5	2	2	1	2	25.59	23.31	73.27	53.03	15.17
5	5	2	2	1	3	23.57	21.29	71.23	53.07	17.24
5	5	2	2	2	1	23.69	21.41	71.51	53.64	19.81
5	5	2	2	2	2	22.89	20.61	70.42	53.78	23.86
5	5	2	2	2	3	24.70	22.42	72.01	53.30	19.83
5	5	2	2	3	1	20.54	18.26	67.18	51.88	19.35
5	5	2	2	3	2	20.88	18.60	69.12	53.79	21.33
7	5	2	2	3	3	20.58	18.30	67.97	52.36	17.23
7	1	1	1	1	1	21.28	19.00	68.19	51.30	12.49
7	1	1	1	1	2	22.94	20.66	70.45	52.35	14.14
7	1	1	1	1	3	25.06	22.78	73.51	53.69	14.93
7	1	1	1	2	1	18.67	16.39	66.38	51.77	12.18
7	1	1	1	2	2	20.74	18.46	68.20	51.87	13.04
7	1	1	1	2	3	17.52	15.24	65.81	51.82	8.93
7	1	1	1	3	1	14.69	12.41	60.63	49.03	6.98
7	1	1	1	3	2	18.14	15.86	63.77	49.23	9.08
7	1	1	1	3	3	21.27	18.99	65.09	47.63	8.76
7	1	1	2	1	1	25.07	22.79	70.19	50.39	15.10
7	1	1	2	1	2	23.78	21.50	70.16	52.11	19.11
7	1	1	2	1	3	26.65	24.37	72.54	51.81	17.56
7	1	1	2	2	1	23.99	21.71	66.87	48.27	16.72
7	1	1	2	2	2	23.54	21.26	66.70	48.21	14.98
7	1	1	2	2	3	18.61	16.33	62.63	48.17	12.93
7	1	1	2	3	1	14.00	11.72	59.21	48.87	13.35
7	1	1	2	3	2	23.00	20.72	67.06	48.54	11.88
7	1	1	2	3	3	24.25	21.97	67.21	47.58	11.92
7	2	1	1	1	1	18.69	16.41	62.82	47.83	9.47
7	2	1	1	1	2	17.37	15.09	60.82	47.14	10.31
7	2	1	1	1	3	18.18	15.90	62.48	47.94	9.35
7	2	1	1	2	1	15.63	13.35	60.48	48.46	11.06
7	2	1	1	2	2	15.98	13.70	60.82	48.32	9.60
7	2	1	1	2	3	20.15	17.87	64.62	48.49	10.79
7	2	1	1	3	1	21.04	18.76	64.26	47.53	12.13
7	2	1	1	3	2	17.49	15.21	61.67	47.98	11.10
7	2	1	1	3	3	16.48	14.20	61.01	48.03	9.40
7	2	1	2	1	1	23.02	20.74	64.88	47.01	16.06
7	2	1	2	1	2	22.85	20.57	66.77	48.69	13.77
7	2	1	2	1	3	22.81	20.53	65.69	48.11	16.78
7	2	1	2	2	1	23.22	20.94	64.98	47.03	16.66
7	2	1	2	2	2	23.86	21.58	67.73	49.11	15.90
7	2	1	2	2	3	22.82	20.54	66.42	48.79	16.51
7	2	1	2	3	1	26.32	24.04	68.44	47.44	14.48
7	2	1	2	3	2	25.38	23.10	68.32	47.95	13.40
7	2	1	2	3	3	24.93	22.65	69.43	49.76	15.15
7	3	1	1	1	1	16.37	14.09	60.45	47.48	8.64
7	3	1	1	1	2	16.10	13.82	61.92	49.16	8.31
7	3	1	1	1	3	19.87	17.59	65.53	49.27	8.18
7	3	1	1	2	1	16.58	14.30	62.32	49.27	9.58
7	3	1	1	2	2	15.18	12.90	60.81	48.72	6.70
7	3	1	1	2	3	14.54	12.26	60.19	48.99	9.46
7	3	1	1	3	1	13.58	11.30	58.04	47.74	9.71
7	3	1	1	3	2	18.38	16.10	62.23	47.72	10.96
7	3	1	1	3	3	17.82	15.54	61.95	47.52	7.69
7	3	1	2	1	1	23.61	21.33	66.18	47.34	13.22
7	3	1	2	1	2	26.30	24.02	69.61	48.54	14.00
7	3	1	2	1	3	24.31	22.03	67.17	47.78	13.62
7	3	1	2	2	1	25.21	22.93	68.50	48.73	15.98
7	3	1	2	2	2	24.73	22.45	66.59	47.33	16.56
7	3	1	2	2	3	16.96	14.68	60.60	47.77	14.42
7	3	1	2	3	1	24.26	21.98	67.53	47.86	11.74
7	3	1	2	3	2	27.05	24.77	71.16	49.00	11.78
7	3	1	2	3	3	23.70	21.42	67.07	48.35	14.42
7	4	1	1	1	1	14.52	12.24	59.88	48.98	12.29
7	4	1	1	1	2	12.78	10.50	57.67	48.22	11.11
7	4	1	1	1	3	15.24	12.96	59.48	48.10	13.88
7	4	1	1	2	1	15.26	12.98	59.98	48.29	11.04
7	4	1	1	2	2	14.98	12.70	58.70	47.59	14.31
7	4	1	1	2	3	14.72	12.44	59.25	48.30	13.61
7	4	1	1	3	1	16.99	14.71	43.24	30.60	16.38
7	4	1	1	3	2	18.38	16.10	44.17	29.99	13.54
7	4	1	1	3	3	16.52	14.24	41.89	29.51	15.02
7	4	1	2	1	1	20.20	17.92	62.71	48.29	24.27
7	4	1	2	1	2	21.90	19.62	63.79	48.00	24.26
7	4	1	2	1	3	19.80	17.52	63.27	49.05	23.21
7	4	1	2	2	1	21.90	19.62	64.27	48.20	22.09
7	4	1	2	2	2	21.36	19.08	46.26	30.65	22.23
7	4	1	2	2	3	20.60	18.32	44.87	29.92	22.54
7	4	1	2	3	1	22.00	19.72	46.25	30.04	21.65
7	4	1	2	3	2	24.61	22.33	48.65	29.50	16.61
7	4	1	2	3	3	25.46	23.18	48.85	29.42	19.30

A	B	C	D	E	F	G	H	I	J	K
7	5	1	1	1	1	17.79	15.51	66.27	52.27	10.79
7	5	1	1	1	2	8.91	6.63	56.79	51.16	17.76
7	5	1	1	1	3	18.67	16.39	67.14	52.22	9.85
7	5	1	1	2	1	19.21	16.93	65.35	50.02	10.44
7	5	1	1	2	2	18.61	16.33	66.42	51.80	11.70
7	5	1	1	2	3	13.14	10.86	62.35	52.02	5.13
7	5	1	1	3	1	17.60	15.32	66.31	52.22	8.73
7	5	1	1	3	2	18.57	16.29	65.43	50.83	11.58
7	5	1	1	3	3	17.38	15.10	65.80	51.83	8.09
7	5	1	2	1	1	25.10	22.82	72.43	52.47	14.33
7	5	1	2	1	2	21.82	19.54	68.86	52.05	16.24
7	5	1	2	1	3	22.58	20.30	66.97	50.26	21.48
7	5	1	2	2	1	18.83	16.55	68.18	54.03	16.96
7	5	1	2	2	2	25.90	23.62	69.92	49.75	17.10
7	5	1	2	2	3	23.07	20.79	69.62	52.24	19.62
7	5	1	2	3	1	26.41	24.13	74.73	53.95	16.12
7	5	1	2	3	2	24.54	22.26	70.65	51.62	16.97
7	5	1	2	3	3	22.10	19.82	68.59	51.88	18.61
12	1	1	1	1	1	18.53	16.25	67.58	52.15	5.31
12	1	1	1	1	2	19.13	16.85	68.07	52.40	7.53
12	1	1	1	1	3	20.32	18.04	68.78	52.39	10.07
12	1	1	1	2	1	17.67	15.39	65.60	50.95	5.05
12	1	1	1	2	2	23.48	21.20	70.58	50.58	6.00
12	1	1	1	2	3	18.12	15.84	67.95	52.95	5.60
12	1	1	1	3	1	18.29	16.01	67.47	52.63	7.88
12	1	1	1	3	2	16.36	14.08	65.90	52.65	6.26
12	1	1	1	3	3	17.36	15.08	66.30	52.04	5.75
12	1	1	2	1	1	19.90	17.62	68.87	52.82	9.78
12	1	1	2	1	2	20.93	18.65	68.89	52.51	13.86
12	1	1	2	1	3	20.83	18.55	68.62	52.93	18.23
12	1	1	2	2	1	22.31	20.03	69.97	51.89	10.79
12	1	1	2	2	2	22.45	20.17	68.96	51.43	15.06
12	1	1	2	2	3	20.29	18.01	67.81	51.32	9.22
12	1	1	2	3	1	18.90	16.62	66.57	51.57	10.80
12	1	1	2	3	2	16.78	14.50	63.35	50.66	14.26
12	1	1	2	3	3	21.87	19.59	69.41	51.86	11.62
12	2	1	1	1	1	21.82	19.54	70.65	52.50	7.66
12	2	1	1	1	2	16.75	14.47	65.30	51.80	7.19
12	2	1	1	1	3	21.64	19.36	70.56	52.38	6.49
12	2	1	1	2	1	16.54	14.26	67.27	53.46	3.26
12	2	1	1	2	2	17.62	15.34	65.35	51.06	7.35
12	2	1	1	2	3	20.06	17.78	70.22	53.85	8.61
12	2	1	1	3	1	20.46	18.18	69.87	52.78	6.38
12	2	1	1	3	2	17.24	14.96	66.09	52.07	6.70
12	2	1	1	3	3	21.47	19.19	70.03	52.49	9.41
12	2	1	2	1	1	23.41	21.13	71.05	52.34	12.93
12	2	1	2	1	2	23.67	21.39	72.04	53.03	12.52
12	2	1	2	1	3	24.01	21.73	72.46	53.07	12.07
12	2	1	2	2	1	21.82	19.54	71.56	53.64	9.04
12	2	1	2	2	2	24.10	21.82	73.05	53.78	13.23
12	2	1	2	2	3	25.33	23.05	73.41	53.30	14.62
12	2	1	2	3	1	23.05	20.77	70.91	51.88	9.14
12	2	1	2	3	2	22.85	20.57	71.77	53.79	14.40
12	2	1	2	3	3	23.92	21.64	71.25	52.36	14.56
12	3	1	1	2	1	17.65	15.37	65.94	51.30	4.99
12	3	1	1	2	2	13.51	11.23	63.30	52.35	2.56
12	3	1	1	2	3	19.32	17.04	69.75	53.69	6.10
12	3	1	1	3	1	13.20	10.92	62.37	51.77	3.02
12	3	1	1	3	2	20.99	18.71	69.61	51.87	5.47
12	3	1	1	3	3	16.88	14.60	65.60	51.82	5.95
12	3	1	2	2	1	22.11	19.83	67.65	50.39	14.89
12	3	1	2	2	2	21.03	18.75	68.63	52.11	13.50
12	3	1	2	2	3	27.30	25.02	74.20	51.81	11.75
12	3	1	2	3	1	25.59	23.31	68.70	48.27	14.10
12	3	1	2	3	2	26.98	24.70	70.81	48.21	9.29
12	3	1	2	3	3	25.86	23.58	68.56	48.17	15.64
12	4	1	1	1	1	15.87	13.59	61.46	49.03	9.33
12	4	1	1	1	2	16.65	14.37	62.56	49.23	7.80
12	4	1	1	1	3	14.20	11.92	58.66	47.63	8.07
12	4	1	1	2	1	14.48	12.20	59.23	47.83	7.02
12	4	1	1	2	2	13.78	11.50	57.98	47.14	6.09
12	4	1	1	2	3	16.65	14.37	61.01	47.94	9.95
12	4	1	1	3	1	15.64	13.12	60.96	48.46	4.96
12	4	1	1	3	2	17.61	15.09	62.37	48.32	7.40
12	4	1	1	3	3	17.43	14.91	62.00	48.49	10.36
12	4	1	2	1	1	20.00	17.72	63.57	48.87	20.54
12	4	1	2	1	2	21.67	19.39	64.60	48.54	20.73
12	4	1	2	1	3	20.82	18.54	62.89	47.58	21.10
12	4	1	2	2	1	20.76	18.48	62.49	47.01	19.38
12	4	1	2	2	2	21.57	19.29	64.96	48.69	18.56
12	4	1	2	2	3	22.06	19.78	64.61	48.11	19.88
12	4	1	2	3	1	22.41	19.89	64.11	47.03	16.45
12	4	1	2	3	2	22.52	20.00	66.56	49.11	14.61
12	4	1	2	3	3	21.54	19.02	64.61	48.79	20.23
12	5	1	1	1	1	15.76	13.24	60.33	47.53	3.44
12	5	1	1	1	2	13.67	11.15	58.81	47.98	2.95
12	5	1	1	1	3	15.03	12.51	60.12	48.03	3.47
12	5	1	1	2	1	16.57	14.05	60.58	47.48	7.25
12	5	1	1	2	2	17.28	14.76	63.36	49.16	3.94
12	5	1	1	2	3	13.32	10.80	59.68	49.27	3.75
12	5	1	1	3	1	13.50	10.98	59.97	49.27	2.62
12	5	1	1	3	2	12.58	10.06	58.46	48.72	3.29
12	5	1	1	3	3	15.50	12.98	61.46	48.99	4.09
12	5	1	2	1	1	24.40	21.88	66.49	47.44	14.86
12	5	1	2	1	2	23.79	21.27	66.24	47.95	16.29
12	5	1	2	1	3	26.37	23.85	70.39	49.76	15.61
12	5	1	2	2	1	23.53	21.01	65.29	47.34	17.05
12	5	1	2	2	2	22.33	19.81	64.40	48.54	24.91
12	5	1	2	2	3	20.39	17.87	63.17	47.78	16.11
12	5	1	2	3	1	21.78	19.26	65.33	48.73	16.02
12	5	1	2	3	2	20.41	17.89	63.12	47.33	13.30
12	5	1	2	3	3	21.24	18.72	63.50	47.77	19.01
33	1	1	1	1	1	18.11	15.59	67.44	52.27	2.77
33	1	1	1	1	2	22.87	20.35	70.93	51.16	2.93
33	1	1	1	1	3	21.24	18.72	70.38	52.22	3.08
33	1	1	1	2	1	21.32	18.80	68.26	50.02	3.07
33	1	1	1	2	2	18.20	15.68	67.15	51.80	2.15
33	1	1	1	2	3	20.55	18.03	69.35	52.02	4.04
33	1	1	1	3	1	23.88	21.36	73.02	52.22	2.69
33	1	1	1	3	2	21.65	19.13	69.58	50.83	2.03
33	1	1	1	3	3	20.84	18.32	69.72	51.83	2.40
33	1	1	2	1	1	21.34	18.82	70.31	52.47	5.49
33	1	1	2	1	2	21.75	19.23	70.06	52.05	6.77
33	1	1	2	1	3	26.14	23.62	72.44	50.26	6.49
33	1	1	2	2	1	22.10	19.58	72.26	54.03	7.41
33	1	1	2	2	2	19.51	16.99	65.96	49.75	4.81
33	1	1	2	2	3	22.71	20.19	70.47	52.24	10.75
33	1	1	2	3	1	19.99	17.47	70.16	53.95	7.77
33	1	1	2	3	2	20.96	18.44	69.16	51.62	5.13
33	1	1	2	3	3	19.91	17.39	68.34	51.88	5.65
33	2	1	1	1	1	14.54	12.02	63.93	52.15	2.04
33	2	1	1	1	2	17.83	15.31	67.29	52.40	2.82
33	2	1	1	1	3	21.54	19.02	70.92	52.39	2.64
33	2	1	1	2	1	17.85	15.33	65.95	50.95	2.20
33	2	1	1	2	2	17.81	15.29	65.53	50.58	2.27
33	2	1	1	2	3	20.33	17.81	70.35	52.95	2.36
33	2	1	1	3	1	17.92	15.40	67.68	52.63	2.33
33	2	1	1	3	2	13.06	10.54	62.75	52.51	2.93
33	2	1	1	3	3	17.52	15.00	66.67	52.04	2.53
33	2	1	2	1	1	22.50	19.98	71.92	52.82	4.61
33	2	1	2	1	2	25.19	22.67	74.36	52.65	4.42
33	2	1	2	1	3	23.21	20.69	72.43	52.93	6.10
33	2	1	2	2	1	21.63	19.11	70.02	51.89	5.41
33	2	1	2	2	2	23.75	21.23	71.70	51.43	4.74
33	2	1	2	2	3	23.73	21.21	71.49	51.32	5.16
33	2	1	2	3	1	22.83	20.31	70.92	51.57	4.96
33	2	1	2	3	2	26.50	23.98	73.00	50.66	7.34
33	2	1	2	3	3	22.70	20.18	71.07	51.86	5.05
33	3	1	1	1	1	16.28	13.76	65.91	52.50	2.61
33	3	1	1	1	2	16.98	14.46	65.80	51.80	3.29
33	3	1	1	1	3	17.52	15.00	66.86	52.38	3.59
33	3	1	1	2	1	17.71	15.19	68.26	53.46	2.54
33	3	1	1	2	2	18.81	16.29	66.87	51.06	3.04
33	3	1	1	2	3	15.95	13.43	66.94	53.85	2.60
33	3	1	1	3	1	15.84	13.32	65.70	52.78	3.10
33	3	1	1	3	2	15.52	13.00	64.78	52.07	2.28
33	3	1	1	3	3	18.04	15.52	67.64	52.49	2.44
33	3	1	2	1	1	22.66	20.14	71.11	52.34	7.30
33	3	1	2	1	2	22.12	19.60	71.54	53.03	5.39
33	3	1	2	2	1	25.02	22.50	74.42	53.64	8.28
33	3	1	2	2	2	24.82	22.30	74.42	53.78	8.04
33	3	1	2	2	3	26.89	24.37	75.61	53.30	9.23
33	3	1	2	3	1	22.41	19.89	70.58	51.88	6.36
33	3	1	2	3	2	22.56	20.04	72.36	53.79	7.92
33	3	1	2	3	3	23.18	20.66	71.17	52.36	9.34

A	B	C	D	E	F	G	H	I	J	K
33	4	1	1	1	1	13.60	11.08	62.09	51.30	2.69
33	4	1	1	1	2	17.45	14.93	66.82	52.35	3.18
33	4	1	1	1	3	16.11	13.59	66.93	53.69	2.64
33	4	1	1	2	1	16.43	13.91	65.23	51.77	3.34
33	4	1	1	2	2	15.17	12.65	64.11	51.87	3.35
33	4	1	1	2	3	16.93	14.41	65.81	51.82	3.00
33	4	1	1	3	1	17.77	15.25	63.86	49.03	2.83
33	4	1	1	3	2	16.51	13.99	62.71	49.23	3.78
33	4	1	1	3	3	19.04	16.52	63.59	47.63	3.51
33	4	1	2	1	1	18.84	16.32	65.71	50.39	6.53
33	4	1	2	1	2	18.69	16.17	67.14	52.11	7.58
33	4	1	2	1	3	21.01	18.49	69.01	51.81	7.50
33	4	1	2	2	1	20.43	17.91	64.91	48.27	7.63
33	4	1	2	2	2	16.84	14.32	61.56	48.21	7.27
33	4	1	2	2	3	19.47	16.95	63.93	48.17	7.55
33	4	1	2	3	1	20.60	18.08	65.42	48.87	9.24
33	4	1	2	3	2	20.83	18.31	65.61	48.54	7.26
33	4	1	2	3	3	18.65	16.13	62.56	47.58	7.68
33	5	1	1	1	1	16.80	14.28	61.76	47.83	2.51
33	5	1	1	1	2	14.20	11.68	58.53	47.14	2.55
33	5	1	1	1	3	13.61	11.09	58.57	47.94	4.33
33	5	1	1	2	1	15.71	13.19	61.32	48.46	2.57
33	5	1	1	2	2	14.87	12.35	60.35	48.32	2.66
33	5	1	1	2	3	11.17	8.65	56.93	48.49	2.49
33	5	1	1	3	1	16.00	13.48	60.66	47.53	2.67
33	5	1	1	3	2	20.04	17.52	64.82	47.98	4.04
33	5	1	2	1	1	23.20	20.68	66.49	47.01	6.16
33	5	1	2	1	2	23.10	20.58	67.98	48.69	6.69
33	5	1	2	1	3	21.39	18.87	64.49	48.11	15.20
33	5	1	2	2	1	23.91	21.39	66.57	47.03	9.47
33	5	1	2	2	2	22.92	20.40	67.39	49.11	3.05
33	5	1	2	2	3	22.01	19.49	67.37	48.79	4.30
33	5	1	2	3	1	26.74	24.22	70.09	47.44	6.93
33	5	1	2	3	2	26.64	24.12	69.20	47.95	13.51
33	5	1	2	3	3	18.56	16.04	64.71	49.76	7.29

Appendix 6 - Table 6

A - Days after thorough soaking rain

B - Site along the topographic gradient (1=ridge, 5=toe of slope)

C - Moisture Treatment
  1 - Control
  2 - Irrigated

D - Soil Strata
  1 - 0 to 5 cm
  2 - 10 to 15 cm

E - Replicate Number

F - Sample Number

G - Soil Wet Weight with sample bag (g)

H - Soil Wet Weight (g)

I - Soil Dry Weight with can (g)

J - Can Weight (g)

K - Soil Percent Dry Weight (g)
  (Wet wt. - Dry wt.)/Dry wt.

Table 7. Pressure plate analysis data from individual samples.

A	B	C	D	E	F	G	H	I
1	1	1	0.10	1	56.22	48.58	24.97	32.36
1	1	1	0.10	2	56.16	48.64	25.44	32.41
1	1	1	0.10	3	58.02	50.00	25.06	32.16
1	1	1	0.20	1	51.60	46.70	25.20	22.79
1	1	1	0.20	2	48.36	44.03	24.95	22.69
1	1	1	0.20	3	52.67	47.62	24.85	22.18
1	1	1	0.50	1	51.72	47.59	24.97	18.26
1	1	1	0.50	2	50.43	46.65	25.44	17.82
1	1	1	0.50	3	48.66	45.06	25.06	18.00
1	1	1	0.75	1	49.87	46.34	24.97	16.52
1	1	1	0.75	2	53.34	49.42	25.44	16.35
1	1	1	0.75	3	48.92	45.58	25.06	16.28
1	1	1	1.00	1	52.24	48.77	24.97	14.58
1	1	1	1.00	2	49.50	46.40	25.44	14.79
1	1	1	1.00	3	48.64	45.62	25.06	14.69
1	1	1	2.00	1	52.95	50.03	26.76	12.55
1	1	1	2.00	2	63.66	60.50	35.73	12.76
1	1	1	2.00	3	52.82	49.90	26.93	12.71
1	1	1	3.50	1	48.71	46.14	24.97	12.14
1	1	1	3.50	2	49.99	47.31	25.44	12.25
1	1	1	3.50	3	49.80	47.09	25.06	12.30
1	1	1	5.00	1	54.10	51.45	28.21	11.40
1	1	1	5.00	2	48.55	46.16	25.39	11.51
1	1	1	5.00	3	52.48	49.66	25.35	11.60
1	1	1	7.50	1	50.08	47.66	26.76	11.58
1	1	1	7.50	2	59.23	56.76	35.73	11.75
1	1	1	7.50	3	51.83	49.18	26.93	11.91
1	1	1	10.00	1	46.36	44.35	26.76	11.43
1	1	1	10.00	2	57.74	55.41	35.73	11.84
1	1	1	10.00	3	53.79	50.84	26.93	12.34
1	1	1	12.50	1	50.13	47.56	26.76	12.36
1	1	1	12.50	2	59.64	57.08	35.73	11.99
1	1	1	12.50	3	50.13	47.68	26.93	11.81
1	1	1	15.00	1	56.29	53.17	25.20	11.15
1	1	1	15.00	2	52.13	49.45	24.95	10.94
1	1	1	15.00	3	50.68	48.13	24.85	10.95
1	1	2	0.10	1	63.31	54.17	26.23	32.71
1	1	2	0.10	2	58.50	51.20	28.86	32.68
1	1	2	0.10	3	55.95	48.22	25.14	33.49
1	1	2	0.20	1	53.19	47.77	25.09	23.90
1	1	2	0.20	2	53.58	48.03	25.07	24.17
1	1	2	0.20	3	55.61	49.44	24.83	25.07
1	1	2	0.50	1	53.22	48.87	26.23	19.21
1	1	2	0.50	2	57.84	53.26	28.86	18.77
1	1	2	0.50	3	54.01	49.38	25.14	19.10
1	1	2	0.75	1	52.34	48.46	26.23	17.45
1	1	2	0.75	2	54.76	50.94	28.86	17.30
1	1	2	0.75	3	50.03	46.27	25.14	17.79
1	1	2	1.00	1	51.63	48.21	26.23	15.56
1	1	2	1.00	2	53.74	50.39	28.86	15.56
1	1	2	1.00	3	50.68	47.28	25.14	15.36
1	1	2	2.00	1	49.75	46.76	23.83	13.04
1	1	2	2.00	2	61.95	58.66	33.46	13.06
1	1	2	2.00	3	56.11	53.31	31.54	12.86
1	1	2	3.50	1	52.56	49.64	26.23	12.47
1	1	2	3.50	2	52.46	49.84	28.86	12.49
1	1	2	3.50	3	50.37	47.60	25.14	12.33
1	1	2	5.00	1	55.00	52.04	26.27	11.49
1	1	2	5.00	2	54.10	51.03	25.58	12.06
1	1	2	5.00	3	52.86	50.10	26.42	11.66
1	1	2	7.50	1	46.12	43.78	23.83	11.73
1	1	2	7.50	2	57.42	54.89	33.46	11.81
1	1	2	7.50	3	55.91	53.31	31.54	11.94
1	1	2	10.00	1	46.39	43.96	23.83	12.07
1	1	2	10.00	2	59.02	56.26	33.46	12.11
1	1	2	10.00	3	55.91	53.29	31.54	12.05
1	1	2	12.50	1	48.51	45.86	23.83	12.03
1	1	2	12.50	2	56.39	53.93	33.46	12.02
1	1	2	12.50	3	56.31	53.60	31.54	12.28
1	1	2	15.00	1	52.79	50.05	25.09	10.98
1	1	2	15.00	2	52.24	49.55	25.07	10.99
1	1	2	15.00	3	52.92	50.12	24.83	11.07
1	2	1	0.10	1	56.27	49.74	26.19	27.73
1	2	1	0.10	2	58.58	51.17	25.67	29.06
1	2	1	0.10	3	59.13	51.67	26.08	29.15
1	2	1	0.20	1	55.97	50.95	24.97	19.32
1	2	1	0.20	2	54.33	49.59	25.44	19.63
1	2	1	0.20	3	54.34	49.53	25.06	19.66
1	2	1	0.50	1	54.66	50.18	26.19	18.67
1	2	1	0.50	2	53.98	49.77	25.67	17.47
1	2	1	0.50	3	51.80	47.82	26.08	18.31
1	2	1	0.75	1	54.17	50.40	26.19	15.57
1	2	1	0.75	2	50.79	47.49	25.67	15.12
1	2	1	0.75	3	53.70	50.15	26.08	14.75
1	2	1	1.00	1	52.33	49.14	26.19	13.90
1	2	1	1.00	2	55.10	51.58	25.67	13.59
1	2	1	1.00	3	54.84	51.40	26.08	13.59
1	2	1	2.00	1	57.48	54.68	30.67	11.66
1	2	1	2.00	2	54.98	52.20	28.20	11.58
1	2	1	2.00	3	50.09	47.66	26.35	11.40
1	2	1	3.50	1	50.84	48.32	25.19	10.89
1	2	1	3.50	2	50.66	48.04	25.67	11.71
1	2	1	3.50	3	49.35	47.04	26.08	11.02
1	2	1	5.00	1	55.02	52.23	26.29	10.76
1	2	1	5.00	2	57.40	54.79	29.71	10.41
1	2	1	5.00	3	55.38	52.48	25.03	10.56
1	2	1	7.50	1	55.74	53.23	30.67	11.13
1	2	1	7.50	2	51.02	48.79	28.20	10.83
1	2	1	7.50	3	48.72	46.54	26.35	10.80
1	2	1	10.00	1	55.95	53.43	30.67	11.07
1	2	1	10.00	2	50.72	48.54	28.20	10.72
1	2	1	10.00	3	52.95	50.29	26.35	11.11
1	2	1	12.50	1	55.76	53.26	30.67	11.07
1	2	1	12.50	2	53.32	50.74	28.20	11.45
1	2	1	12.50	3	50.81	48.44	26.35	10.73
1	2	1	15.00	1	51.84	49.40	24.97	9.99
1	2	1	15.00	2	55.45	52.64	25.44	10.33
1	2	1	15.00	3	54.36	51.69	25.06	10.03
1	2	2	0.10	1	59.10	52.37	25.99	25.51
1	2	2	0.10	2	57.32	50.44	25.26	27.32
1	2	2	0.10	3	56.12	49.73	26.68	27.72
1	2	2	0.20	1	55.08	50.48	26.23	18.97
1	2	2	0.20	2	58.21	53.47	28.86	19.26
1	2	2	0.20	3	53.80	49.24	25.14	18.92
1	2	2	0.50	1	54.72	50.41	25.99	17.65
1	2	2	0.50	2	54.05	49.78	25.26	17.41
1	2	2	0.50	3	51.77	48.14	26.68	16.92
1	2	2	0.75	1	53.55	49.86	25.99	15.46
1	2	2	0.75	2	51.80	48.29	25.26	15.24
1	2	2	0.75	3	52.76	49.38	26.68	14.89
1	2	2	1.00	1	51.13	48.06	25.99	13.91
1	2	2	1.00	2	53.49	50.12	25.26	13.56
1	2	2	1.00	3	51.93	48.90	26.68	13.64
1	2	2	2.00	1	50.61	48.04	25.23	11.27
1	2	2	2.00	2	49.12	46.77	25.70	11.15
1	2	2	2.00	3	50.35	47.95	26.44	11.16
1	2	2	3.50	1	55.01	52.13	25.99	11.02
1	2	2	3.50	2	50.30	47.83	25.26	10.94
1	2	2	3.50	3	52.35	49.76	26.68	11.22

A	B	C	D	E	F	G	H	I
1	2	2	5.00	1	56.09	53.21	25.49	10.39
1	2	2	5.00	2	54.95	52.12	25.18	10.50
1	2	2	5.00	3	59.34	56.12	26.48	10.86
1	2	2	7.50	1	50.65	48.19	25.23	10.71
1	2	2	7.50	2	49.45	47.19	25.70	10.52
1	2	2	7.50	3	51.65	49.25	26.44	10.52
1	2	2	10.00	1	45.84	43.89	25.23	10.45
1	2	2	10.00	2	50.79	48.33	25.70	10.87
1	2	2	10.00	3	47.61	45.67	26.44	10.09
1	2	2	12.50	1	52.24	49.67	25.23	10.52
1	2	2	12.50	2	51.33	48.90	25.70	10.47
1	2	2	12.50	3	49.30	47.17	26.44	10.27
1	2	2	15.00	1	56.10	53.41	26.23	9.90
1	2	2	15.00	2	56.82	54.26	28.86	10.08
1	2	2	15.00	3	55.07	52.28	25.14	10.28
2	1	1	0.10	1	60.04	52.35	26.35	29.58
2	1	1	0.10	2	57.54	50.55	26.86	29.51
2	1	1	0.10	3	63.08	55.91	31.62	29.52
2	1	1	0.20	1	52.98	49.28	26.19	16.02
2	1	1	0.20	2	53.10	49.30	25.67	16.08
2	1	1	0.20	3	52.87	49.11	26.08	16.33
2	1	1	0.50	1	50.67	47.13	26.35	17.04
2	1	1	0.50	2	54.12	50.45	26.86	15.56
2	1	1	0.50	3	58.20	54.59	31.62	15.72
2	1	1	0.75	1	52.82	49.44	26.35	14.64
2	1	1	0.75	2	52.83	49.64	26.86	14.00
2	1	1	0.75	3	56.35	53.42	31.62	13.44
2	1	1	1.00	1	51.84	48.89	26.35	13.09
2	1	1	1.00	2	53.96	50.99	26.86	12.31
2	1	1	1.00	3	59.01	56.04	31.62	12.16
2	1	1	2.00	1	51.41	49.05	25.24	9.91
2	1	1	2.00	2	50.12	47.92	25.14	9.66
2	1	1	2.00	3	49.71	47.53	25.07	9.71
2	1	1	3.50	1	49.32	47.37	26.35	9.28
2	1	1	3.50	2	52.30	50.13	26.86	9.33
2	1	1	3.50	3	59.52	57.08	31.62	9.58
2	1	1	5.00	1	54.64	52.51	26.76	8.27
2	1	1	5.00	2	63.54	61.42	35.73	8.25
2	1	1	5.00	3	54.52	52.34	26.93	8.58
2	1	1	7.50	1	51.32	49.13	25.24	9.17
2	1	1	7.50	2	49.62	47.65	25.14	8.75
2	1	1	7.50	3	49.78	47.68	25.07	9.29
2	1	1	10.00	1	53.18	50.77	25.24	9.44
2	1	1	10.00	2	50.72	48.62	25.14	8.94
2	1	1	10.00	3	50.88	48.69	25.07	9.27
2	1	1	12.50	1	48.79	46.86	25.24	8.93
2	1	1	12.50	2	53.30	50.95	25.14	9.10
2	1	1	12.50	3	49.43	47.44	25.07	8.90
2	1	1	15.00	1	55.38	53.20	26.19	8.07
2	1	1	15.00	2	51.66	49.87	25.67	7.40
2	1	1	15.00	3	55.52	53.37	26.08	7.88
2	1	2	0.10	1	60.56	53.34	27.67	28.13
2	1	2	0.10	2	63.21	55.26	27.13	28.26
2	1	2	0.10	3	59.94	52.27	25.64	28.80
2	1	2	0.20	1	55.60	51.53	25.99	15.94
2	1	2	0.20	2	52.45	48.72	25.26	15.90
2	1	2	0.20	3	54.78	50.98	26.68	15.64
2	1	2	0.50	1	59.12	54.83	27.67	15.80
2	1	2	0.50	2	54.63	50.97	27.13	15.35
2	1	2	0.50	3	52.97	49.49	25.64	14.59
2	1	2	0.75	1	54.64	51.18	27.67	14.72
2	1	2	0.75	2	56.08	52.55	27.13	13.89
2	1	2	0.75	3	51.22	48.19	25.64	13.44
2	1	2	1.00	1	56.91	53.61	27.67	12.72
2	1	2	1.00	2	55.61	52.57	27.13	11.95
2	1	2	1.00	3	55.58	52.44	25.64	11.72
2	1	2	2.00	1	51.53	49.36	26.42	9.46
2	1	2	2.00	2	56.26	54.07	31.19	9.57
2	1	2	2.00	3	51.58	49.43	26.42	9.34
2	1	2	3.50	1	55.40	53.09	27.67	9.09
2	1	2	3.50	2	55.04	52.74	27.13	8.98
2	1	2	3.50	3	50.29	48.27	25.64	8.93
2	1	2	5.00	1	52.55	50.39	23.83	8.13
2	1	2	5.00	2	60.79	58.75	33.46	8.07
2	1	2	5.00	3	59.98	57.86	31.54	8.05
2	1	2	7.50	1	52.73	50.68	26.42	8.45
2	1	2	7.50	2	55.84	53.86	31.19	8.73
2	1	2	7.50	3	53.90	51.74	26.42	8.53
2	1	2	10.00	1	50.13	48.29	26.42	8.41
2	1	2	10.00	2	58.50	56.36	31.19	8.50
2	1	2	10.00	3	49.34	47.57	26.42	8.37
2	1	2	12.50	1	50.96	49.13	26.42	8.06
2	1	2	12.50	2	58.33	56.27	31.19	8.21
2	1	2	12.50	3	52.21	50.26	26.42	8.18
2	1	2	15.00	1	53.90	52.06	25.99	7.06
2	1	2	15.00	2	55.42	53.36	25.26	7.33
2	1	2	15.00	3	54.99	53.03	26.68	7.44
2	2	1	0.10	1	65.91	57.29	27.23	28.68
2	2	1	0.10	2	60.77	52.96	25.47	28.41
2	2	1	0.10	3	65.57	57.90	31.96	29.57
2	2	1	0.20	1	55.54	51.50	26.35	16.06
2	2	1	0.20	2	55.28	51.37	26.86	15.95
2	2	1	0.20	3	57.97	54.37	31.62	15.82
2	2	1	0.50	1	58.82	54.35	27.23	16.48
2	2	1	0.50	2	51.59	47.95	25.47	16.19
2	2	1	0.50	3	58.70	55.03	31.96	15.91
2	2	1	0.75	1	53.93	50.24	27.23	16.04
2	2	1	0.75	2	53.27	49.44	25.47	15.98
2	2	1	0.75	3	56.57	53.24	31.96	15.65
2	2	1	1.00	1	55.96	52.88	27.23	12.01
2	2	1	1.00	2	55.87	52.62	25.47	11.97
2	2	1	1.00	3	60.30	57.30	31.96	11.84
2	2	1	2.00	1	49.71	47.60	25.81	9.68
2	2	1	2.00	2	51.13	48.92	26.07	9.67
2	2	1	2.00	3	50.15	47.95	25.14	9.64
2	2	1	3.50	1	54.71	52.40	27.23	9.18
2	2	1	3.50	2	52.20	49.94	25.47	9.24
2	2	1	3.50	3	54.83	52.92	31.96	9.11
2	2	1	5.00	1	58.80	56.62	30.67	8.40
2	2	1	5.00	2	55.62	53.44	28.20	8.64
2	2	1	5.00	3	55.28	53.05	26.35	8.35
2	2	1	7.50	1	52.58	50.40	25.81	8.87
2	2	1	7.50	2	50.02	48.05	26.07	8.96
2	2	1	7.50	3	49.56	47.59	25.14	8.78
2	2	1	10.00	1	51.14	49.09	25.81	8.81
2	2	1	10.00	2	50.00	48.10	26.07	8.62
2	2	1	10.00	3	51.26	49.16	25.14	8.74
2	2	1	12.50	1	49.40	47.51	25.81	8.71
2	2	1	12.50	2	51.85	49.77	26.07	8.78
2	2	1	12.50	3	49.31	47.40	25.14	8.58
2	2	1	15.00	1	56.15	53.92	26.35	8.09
2	2	1	15.00	2	54.58	52.59	26.86	7.73
2	2	1	15.00	3	58.96	57.01	31.62	7.68
2	2	2	0.10	1	54.02	48.02	26.32	27.65
2	2	2	0.10	2	58.25	51.44	27.61	28.58
2	2	2	0.10	3	58.71	51.27	25.16	28.49
2	2	2	0.20	1	52.95	49.32	27.67	16.77
2	2	2	0.20	2	53.29	49.63	27.13	16.27
2	2	2	0.20	3	55.36	51.14	25.64	16.55
2	2	2	0.50	1	52.03	48.33	26.32	16.81
2	2	2	0.50	2	55.40	51.52	27.61	16.23
2	2	2	0.50	3	50.96	47.28	25.16	16.64

A	B	C	D	E	F	G	H	I
2	2	2	0.75	1	52.23	48.53	26.32	16.66
2	2	2	0.75	2	59.69	55.32	27.61	15.77
2	2	2	0.75	3	57.14	52.81	25.16	15.66
2	2	2	1.00	1	53.40	50.32	26.32	12.83
2	2	2	1.00	2	54.40	51.40	27.61	12.61
2	2	2	1.00	3	51.75	48.80	25.16	12.48
2	2	2	2.00	1	53.08	50.49	25.39	10.32
2	2	2	2.00	2	51.78	49.49	26.84	10.11
2	2	2	2.00	3	52.62	50.27	26.96	10.08
2	2	2	3.50	1	50.62	48.54	26.32	9.36
2	2	2	3.50	2	53.31	51.07	27.61	9.55
2	2	2	3.50	3	52.02	49.69	25.16	9.50
2	2	2	5.00	1	53.79	51.50	25.23	8.72
2	2	2	5.00	2	52.55	50.35	25.70	8.92
2	2	2	5.00	3	51.74	49.80	26.44	8.30
2	2	2	7.50	1	51.58	49.41	25.39	9.03
2	2	2	7.50	2	53.51	51.26	26.84	9.21
2	2	2	7.50	3	54.80	52.43	26.96	9.31
2	2	2	10.00	1	54.35	51.90	25.39	9.24
2	2	2	10.00	2	52.31	50.20	26.84	9.03
2	2	2	10.00	3	52.77	50.67	26.96	8.86
2	2	2	12.50	1	49.77	47.81	25.39	8.74
2	2	2	12.50	2	52.06	49.99	26.84	8.94
2	2	2	12.50	3	49.59	47.83	26.96	8.43
2	2	2	15.00	1	54.92	52.89	27.67	8.05
2	2	2	15.00	2	57.66	55.24	27.13	8.61
2	2	2	15.00	3	55.01	52.74	25.64	8.38
3	1	1	0.10	1	57.00	50.86	25.81	24.51
3	1	1	0.10	2	56.01	50.08	26.07	24.70
3	1	1	0.10	3	55.17	48.99	25.14	25.91
3	1	1	0.20	1	54.56	50.51	27.23	17.40
3	1	1	0.20	2	51.69	47.79	25.47	17.47
3	1	1	0.20	3	59.11	55.06	31.96	17.53
3	1	1	0.50	1	49.14	45.64	28.21	20.08
3	1	1	0.50	2	49.84	45.80	25.39	19.79
3	1	1	0.50	3	51.09	46.87	25.35	19.61
3	1	1	0.75	1	57.35	53.66	28.21	14.50
3	1	1	0.75	2	51.66	48.30	25.39	14.67
3	1	1	0.75	3	51.80	48.42	25.35	14.65
3	1	1	1.00	1	55.39	52.13	25.07	12.05
3	1	1	1.00	2	50.78	47.83	25.50	13.21
3	1	1	1.00	3	53.77	50.58	25.17	12.55
3	1	1	2.00	1	53.83	51.06	25.07	10.66
3	1	1	2.00	2	52.20	49.63	25.50	10.65
3	1	1	2.00	3	52.91	50.25	25.17	10.61
3	1	1	3.50	1	50.89	48.83	28.21	9.99
3	1	1	3.50	2	51.43	49.02	25.39	10.20
3	1	1	3.50	3	51.53	49.10	25.35	10.23
3	1	1	5.00	1	55.06	52.52	25.24	9.31
3	1	1	5.00	2	53.60	51.14	25.14	9.46
3	1	1	5.00	3	55.83	53.05	25.07	9.94
3	1	1	7.50	1	47.36	45.38	25.07	9.75
3	1	1	7.50	2	47.31	45.36	25.50	9.82
3	1	1	7.50	3	48.28	46.16	25.17	10.10
3	1	1	10.00	1	49.15	46.96	25.07	10.00
3	1	1	10.00	2	50.30	48.04	25.50	10.03
3	1	1	10.00	3	47.57	45.61	25.17	9.59
3	1	1	12.50	1	48.93	46.75	25.07	10.06
3	1	1	12.50	2	48.37	46.30	25.50	9.95
3	1	1	12.50	3	48.05	46.01	25.17	9.79
3	1	1	15.00	1	53.00	50.87	27.23	9.01
3	1	1	15.00	2	57.29	54.69	25.47	8.90
3	1	1	15.00	3	58.56	56.48	31.96	8.48
3	1	2	0.10	1	56.49	50.49	25.39	23.90
3	1	2	0.10	2	54.56	49.08	26.84	24.64
3	1	2	0.10	3	57.13	51.10	26.96	24.98

A	B	C	D	E	F	G	H	I
3	1	2	0.20	1	51.47	47.64	26.32	17.96
3	1	2	0.20	2	55.17	50.98	27.61	17.93
3	1	2	0.20	3	50.39	46.53	25.16	18.06
3	1	2	0.50	1	55.20	50.56	26.27	19.10
3	1	2	0.50	2	52.78	48.49	25.58	18.73
3	1	2	0.50	3	52.89	48.54	26.42	19.67
3	1	2	0.75	1	52.20	48.85	26.27	14.84
3	1	2	0.75	2	52.10	48.64	25.58	15.00
3	1	2	0.75	3	51.71	48.37	26.42	15.22
3	1	2	1.00	1	53.13	49.86	26.27	13.86
3	1	2	1.00	2	53.47	50.24	25.58	13.10
3	1	2	1.00	3	49.56	46.85	26.42	13.26
3	1	2	2.00	1	51.14	48.67	25.99	10.89
3	1	2	2.00	2	55.39	52.96	30.92	11.03
3	1	2	2.00	3	53.10	50.54	26.98	10.87
3	1	2	3.50	1	52.86	50.39	26.27	10.24
3	1	2	3.50	2	52.66	50.15	25.58	10.22
3	1	2	3.50	3	50.61	48.37	26.42	10.21
3	1	2	5.00	1	54.67	52.17	26.42	9.71
3	1	2	5.00	2	58.86	56.49	31.19	9.37
3	1	2	5.00	3	55.34	52.79	26.42	9.67
3	1	2	7.50	1	48.23	46.27	25.99	9.66
3	1	2	7.50	2	52.39	50.56	30.92	9.32
3	1	2	7.50	3	49.38	47.48	26.98	9.27
3	1	2	10.00	1	51.49	49.27	25.99	9.54
3	1	2	10.00	2	53.23	51.28	30.92	9.58
3	1	2	10.00	3	50.51	48.49	26.98	9.39
3	1	2	12.50	1	51.12	48.92	25.99	9.59
3	1	2	12.50	2	50.77	49.14	30.92	8.95
3	1	2	12.50	3	50.18	48.22	26.98	9.23
3	1	2	15.00	1	51.43	49.47	26.32	8.47
3	1	2	15.00	2	51.14	49.26	27.61	8.68
3	1	2	15.00	3	52.07	50.01	25.16	8.29
3	2	1	0.10	1	54.05	49.07	25.20	20.86
3	2	1	0.10	2	52.45	47.54	24.95	21.74
3	2	1	0.10	3	54.39	49.18	24.85	21.41
3	2	1	0.20	1	54.95	50.12	28.21	22.04
3	2	1	0.20	2	55.84	50.32	25.39	22.14
3	2	1	0.20	3	54.31	49.03	25.35	22.30
3	2	1	0.20	4	52.37	48.03	25.20	19.01
3	2	1	0.20	5	51.01	46.82	24.95	19.16
3	2	1	0.20	6	53.74	49.15	24.85	18.89
3	2	1	0.50	1	53.09	49.54	25.20	14.59
3	2	1	0.50	2	49.14	46.00	24.95	14.92
3	2	1	0.50	3	51.05	47.55	24.85	15.42
3	2	1	0.75	1	54.98	51.53	25.20	13.10
3	2	1	0.75	2	57.36	53.64	24.95	12.97
3	2	1	0.75	3	53.76	50.47	24.85	12.84
3	2	1	1.00	1	53.03	50.04	25.20	12.04
3	2	1	1.00	2	51.58	48.71	24.95	12.08
3	2	1	1.00	3	49.70	47.03	24.85	12.04
3	2	1	2.00	1	57.52	54.47	28.21	11.61
3	2	1	2.00	2	54.90	51.94	25.39	11.15
3	2	1	2.00	3	53.24	50.45	25.35	11.12
3	2	1	3.50	1	52.33	50.09	28.21	10.24
3	2	1	3.50	2	50.66	48.31	25.39	10.25
3	2	1	3.50	3	49.67	47.44	25.35	10.10
3	2	1	5.00	1	57.86	54.98	28.21	10.76
3	2	1	5.00	2	50.51	48.18	25.39	10.22
3	2	1	5.00	3	51.56	49.14	25.35	10.17
3	2	1	10.00	1	51.56	49.52	28.21	9.57
3	2	1	10.00	2	53.37	50.84	25.39	9.94
3	2	1	10.00	3	49.00	46.95	25.35	9.49
3	2	1	15.00	1	48.95	47.18	25.07	8.01
3	2	1	15.00	2	46.59	45.06	25.50	7.82
3	2	1	15.00	3	48.46	46.73	25.17	8.02

A	B	C	D	E	F	G	H	I
3	2	1	15.00	4	50.88	49.11	28.21	8.47
3	2	1	15.00	5	47.00	45.33	25.39	8.38
3	2	1	15.00	6	48.38	46.55	25.35	8.63
3	2	2	0.10	1	55.35	50.20	25.09	20.51
3	2	2	0.10	2	52.77	47.93	25.07	21.17
3	2	2	0.10	3	55.01	49.64	24.83	21.64
3	2	2	0.20	1	57.90	52.12	26.27	22.36
3	2	2	0.20	2	52.19	47.49	25.58	21.45
3	2	2	0.20	3	52.53	47.67	26.42	22.87
3	2	2	0.20	4	54.57	49.83	25.09	19.16
3	2	2	0.20	5	51.93	47.56	25.07	19.43
3	2	2	0.20	6	52.22	47.68	24.83	19.87
3	2	2	0.50	1	53.03	49.29	25.09	15.45
3	2	2	0.50	2	52.20	48.56	25.07	15.50
3	2	2	0.50	3	52.80	48.94	24.83	16.01
3	2	2	0.75	1	55.58	51.92	25.09	13.64
3	2	2	0.75	2	52.28	49.04	25.07	13.52
3	2	2	0.75	3	54.50	50.92	24.83	13.72
3	2	2	1.00	1	55.16	51.77	25.09	12.71
3	2	2	1.00	2	52.09	49.10	25.07	12.44
3	2	2	1.00	3	52.54	49.39	24.83	12.83
3	2	2	2.00	1	54.25	51.43	26.27	11.21
3	2	2	2.00	2	53.62	50.79	25.58	11.23
3	2	2	2.00	3	55.02	52.03	26.42	11.68
3	2	2	3.50	1	49.45	47.32	26.27	10.12
3	2	2	3.50	2	52.30	49.83	25.58	10.19
3	2	2	3.50	3	52.02	49.61	26.42	10.39
3	2	2	5.00	1	51.87	49.49	26.27	10.25
3	2	2	5.00	2	51.86	49.34	25.58	10.61
3	2	2	5.00	3	51.07	48.68	26.42	10.74
3	2	2	10.00	1	52.61	50.36	26.27	9.34
3	2	2	10.00	2	55.77	53.12	25.58	9.62
3	2	2	10.00	3	52.04	49.83	26.42	9.44
3	2	2	15.00	1	47.64	46.09	25.99	7.71
3	2	2	15.00	2	57.13	55.19	30.92	7.99
3	2	2	15.00	3	52.12	50.29	26.98	7.85
3	2	2	15.00	4	52.92	50.79	26.27	8.69
3	2	2	15.00	5	51.91	49.82	25.58	8.62
3	2	2	15.00	6	49.29	47.53	26.42	8.34
4	1	1	0.10	1	55.67	48.30	24.97	31.59
4	1	1	0.10	2	53.44	46.79	25.44	31.15
4	1	1	0.10	3	52.26	45.74	25.06	31.53
4	1	1	0.20	1	48.46	44.12	24.97	22.66
4	1	1	0.20	2	53.22	48.06	25.44	22.81
4	1	1	0.20	3	51.66	46.70	25.06	22.92
4	1	1	0.50	1	49.54	45.44	24.97	20.03
4	1	1	0.50	2	48.46	44.55	25.44	20.46
4	1	1	0.50	3	50.55	46.15	25.06	20.86
4	1	1	0.75	1	50.34	46.81	24.97	16.16
4	1	1	0.75	2	48.66	45.40	25.44	16.33
4	1	1	0.75	3	48.13	44.94	25.06	16.05
4	1	1	1.00	1	49.93	46.73	24.97	14.71
4	1	1	1.00	2	50.63	47.39	25.44	14.76
4	1	1	1.00	3	52.66	49.16	25.06	14.52
4	1	1	2.00	1	49.34	46.65	26.29	13.21
4	1	1	2.00	2	55.68	52.56	29.71	13.65
4	1	1	2.00	3	49.44	46.61	25.03	13.11
4	1	1	3.50	1	49.87	47.18	26.29	12.88
4	1	1	3.50	2	51.39	48.97	29.71	12.56
4	1	1	3.50	3	50.56	47.64	25.03	12.91
4	1	1	5.00	1	49.58	46.94	26.29	12.78
4	1	1	5.00	2	50.75	48.45	29.71	12.27
4	1	1	5.00	3	46.92	44.50	25.03	12.43
4	1	1	10.00	1	50.07	47.44	26.29	12.43
4	1	1	10.00	2	51.99	49.63	29.71	11.85
4	1	1	10.00	3	50.89	48.02	25.03	12.48
4	1	1	15.00	1	48.66	46.47	26.29	10.85
4	1	1	15.00	2	52.22	50.00	29.71	10.94
4	1	1	15.00	3	46.60	44.37	25.03	11.53
4	1	2	0.10	1	57.41	49.58	26.23	33.53
4	1	2	0.10	2	61.16	52.97	28.86	33.97
4	1	2	0.10	3	53.95	46.59	25.14	34.31
4	1	2	0.20	1	53.28	47.96	26.23	24.48
4	1	2	0.20	2	55.81	50.56	28.86	24.19
4	1	2	0.20	3	53.82	48.20	25.14	24.37
4	1	2	0.50	1	53.62	48.92	26.23	20.71
4	1	2	0.50	2	53.15	48.99	28.86	20.67
4	1	2	0.50	3	50.85	46.31	25.14	21.45
4	1	2	0.75	1	50.34	46.88	26.23	16.76
4	1	2	0.75	2	54.80	51.03	28.86	17.00
4	1	2	0.75	3	48.84	45.40	25.14	16.98
4	1	2	1.00	1	48.44	45.47	26.23	15.44
4	1	2	1.00	2	54.90	51.35	28.86	15.78
4	1	2	1.00	3	49.57	46.25	25.14	15.73
4	1	2	2.00	1	49.47	46.61	25.49	13.54
4	1	2	2.00	2	50.55	47.45	25.18	13.92
4	1	2	2.00	3	51.43	48.43	26.48	13.67
4	1	2	3.50	1	50.11	47.31	25.49	12.83
4	1	2	3.50	2	48.93	46.27	25.18	12.61
4	1	2	3.50	3	50.07	47.38	26.48	12.87
4	1	2	5.00	1	50.36	47.52	25.49	12.89
4	1	2	5.00	2	49.89	47.09	25.18	12.78
4	1	2	5.00	3	53.22	50.13	26.48	13.07
4	1	2	10.00	1	49.92	47.28	25.49	12.12
4	1	2	10.00	2	48.58	46.04	25.18	12.18
4	1	2	10.00	3	53.25	50.30	26.48	12.38
4	1	2	15.00	1	51.46	48.89	25.49	10.98
4	1	2	15.00	2	48.81	46.47	25.18	10.99
4	1	2	15.00	3	47.56	45.56	26.48	10.48
4	2	1	0.10	1	56.95	50.32	26.19	27.48
4	2	1	0.10	2	53.80	47.63	25.67	28.10
4	2	1	0.10	3	54.72	48.35	26.08	28.60
4	2	1	0.20	1	52.16	47.33	26.19	22.85
4	2	1	0.20	2	54.51	49.19	25.67	22.62
4	2	1	0.20	3	52.40	47.46	26.08	23.11
4	2	1	0.50	1	51.57	47.66	26.19	18.21
4	2	1	0.50	2	48.94	45.37	25.67	18.12
4	2	1	0.50	3	50.35	46.65	26.08	17.99
4	2	1	0.75	1	54.65	50.80	26.19	15.64
4	2	1	0.75	2	51.15	47.75	25.67	15.40
4	2	1	0.75	3	49.86	46.63	26.08	15.72
4	2	1	1.00	1	50.38	47.28	26.19	14.70
4	2	1	1.00	2	47.07	44.29	25.67	14.93
4	2	1	1.00	3	51.19	47.99	26.08	14.61
4	2	1	2.00	1	52.06	49.11	26.76	13.20
4	2	1	2.00	2	61.62	58.68	35.73	12.81
4	2	1	2.00	3	52.08	49.19	26.93	12.98
4	2	1	3.50	1	49.89	47.33	26.76	12.45
4	2	1	3.50	2	58.00	55.59	35.73	12.13
4	2	1	3.50	3	48.81	46.46	26.93	12.03
4	2	1	5.00	1	49.88	47.39	26.76	12.07
4	2	1	5.00	2	57.32	55.00	35.73	12.04
4	2	1	5.00	3	48.72	46.37	26.93	12.09
4	2	1	10.00	1	50.13	47.68	26.76	11.71
4	2	1	10.00	2	57.77	55.49	35.73	11.54
4	2	1	10.00	3	48.95	46.69	26.93	11.44
4	2	1	15.00	1	49.52	47.33	26.76	10.65
4	2	1	15.00	2	57.48	55.44	35.73	10.35
4	2	1	15.00	3	50.24	48.02	26.93	10.53
4	2	2	0.10	1	57.43	50.71	25.99	27.18
4	2	2	0.10	2	57.96	50.78	25.26	28.13
4	2	2	0.10	3	56.88	50.35	26.68	27.59

A	B	C	D	E	F	G	H	I
4	2	2	0.20	1	53.16	48.20	25.99	22.33
4	2	2	0.20	2	52.50	47.49	26.26	23.60
4	2	2	0.20	3	53.81	48.75	26.68	22.93
4	2	2	0.50	1	50.66	47.00	25.99	17.42
4	2	2	0.50	2	50.23	46.52	26.26	18.31
4	2	2	0.50	3	54.02	49.99	26.68	17.29
4	2	2	0.75	1	55.85	51.90	25.99	15.25
4	2	2	0.75	2	50.35	46.97	26.26	16.32
4	2	2	0.75	3	53.10	49.54	26.68	15.57
4	2	2	1.00	1	53.05	49.77	25.99	13.79
4	2	2	1.00	2	54.75	51.16	26.26	14.42
4	2	2	1.00	3	50.85	47.83	26.68	14.28
4	2	2	2.00	1	49.65	46.94	23.83	11.73
4	2	2	2.00	2	59.52	56.69	33.46	12.18
4	2	2	2.00	3	54.58	52.19	31.54	11.57
4	2	2	3.50	1	47.74	45.35	23.83	11.11
4	2	2	3.50	2	61.47	58.61	33.46	11.37
4	2	2	3.50	3	56.26	53.81	31.54	11.00
4	2	2	5.00	1	50.59	47.81	23.83	11.59
4	2	2	5.00	2	57.46	55.01	33.46	11.37
4	2	2	5.00	3	54.82	52.44	31.54	11.39
4	2	2	10.00	1	49.78	47.31	23.83	10.52
4	2	2	10.00	2	58.01	55.69	33.46	10.44
4	2	2	10.00	3	57.24	54.80	31.54	10.49
4	2	2	15.00	1	51.79	49.29	23.83	9.82
4	2	2	15.00	2	55.69	53.81	33.46	9.24
4	2	2	15.00	3	55.35	53.28	31.54	9.52
5	1	1	0.10	1	55.36	50.53	26.35	19.98
5	1	1	0.10	2	57.36	52.24	26.86	20.17
5	1	1	0.10	3	61.40	56.41	31.62	20.13
5	1	1	0.20	1	52.54	48.87	26.35	16.30
5	1	1	0.20	2	55.45	51.45	26.86	16.27
5	1	1	0.20	3	58.79	54.90	31.62	16.71
5	1	1	0.50	1	50.31	47.27	26.35	14.53
5	1	1	0.50	2	50.84	47.78	26.86	14.63
5	1	1	0.50	3	54.93	51.89	31.62	15.00
5	1	1	0.75	1	50.96	48.09	26.35	13.20
5	1	1	0.75	2	48.77	46.26	26.86	12.94
5	1	1	0.75	3	58.06	55.01	31.62	13.04
5	1	1	1.00	1	52.78	49.88	26.35	12.32
5	1	1	1.00	2	50.91	48.30	26.86	12.17
5	1	1	1.00	3	59.46	56.43	31.62	12.21
5	1	1	2.00	1	57.82	54.66	30.67	13.17
5	1	1	2.00	2	53.02	50.24	28.20	12.61
5	1	1	2.00	3	51.33	48.59	26.35	12.32
5	1	1	3.50	1	56.07	53.34	30.67	12.04
5	1	1	3.50	2	50.71	48.36	28.20	11.66
5	1	1	3.50	3	50.47	47.98	26.35	11.51
5	1	1	5.00	1	55.31	52.80	30.67	11.34
5	1	1	5.00	2	52.14	49.64	28.20	11.66
5	1	1	5.00	3	51.32	48.68	26.35	11.82
5	1	1	10.00	1	55.23	52.64	30.67	11.79
5	1	1	10.00	2	54.68	51.91	28.20	11.68
5	1	1	10.00	3	48.53	46.27	26.35	11.35
5	1	1	15.00	1	55.61	53.20	30.67	10.70
5	1	1	15.00	2	52.14	49.78	28.20	10.94
5	1	1	15.00	3	49.89	47.79	26.35	9.79
5	1	2	0.10	1	58.56	53.66	27.67	18.85
5	1	2	0.10	2	56.77	52.04	27.13	18.99
5	1	2	0.10	3	56.15	51.35	25.64	18.67
5	1	2	0.20	1	55.97	52.26	27.67	15.09
5	1	2	0.20	2	54.31	50.74	27.13	15.12
5	1	2	0.20	3	52.60	49.01	25.64	15.36
5	1	2	0.50	1	55.05	51.90	27.67	13.00
5	1	2	0.50	2	56.87	53.52	27.13	12.69
5	1	2	0.50	3	54.36	51.05	25.64	13.03
5	1	2	0.75	1	56.16	53.25	27.67	11.38
5	1	2	0.75	2	55.59	52.65	27.13	11.52
5	1	2	0.75	3	51.31	48.68	25.64	11.41
5	1	2	1.00	1	53.31	50.84	27.67	10.66
5	1	2	1.00	2	51.70	49.36	27.13	10.53
5	1	2	1.00	3	49.84	47.47	25.64	10.86
5	1	2	2.00	1	55.44	52.51	25.23	10.74
5	1	2	2.00	2	54.99	52.17	25.70	10.65
5	1	2	2.00	3	59.53	56.23	26.44	11.08
5	1	2	3.50	1	53.22	50.77	25.23	9.59
5	1	2	3.50	2	49.95	47.86	25.70	9.43
5	1	2	3.50	3	54.21	51.72	26.44	9.85
5	1	2	5.00	1	47.71	45.79	25.23	9.34
5	1	2	5.00	2	51.34	49.13	25.70	9.43
5	1	2	5.00	3	54.85	52.34	26.44	9.69
5	1	2	10.00	1	49.26	47.24	25.23	9.18
5	1	2	10.00	2	50.96	48.85	25.70	9.11
5	1	2	10.00	3	52.15	49.98	26.44	9.22
5	1	2	15.00	1	48.52	46.79	25.23	8.02
5	1	2	15.00	2	50.59	48.69	25.70	8.26
5	1	2	15.00	3	52.53	50.52	26.44	8.35
5	2	1	0.10	1	57.05	52.09	27.23	19.95
5	2	1	0.10	2	57.64	52.16	25.47	20.53
5	2	1	0.10	3	57.48	53.09	31.96	20.78
5	2	1	0.20	1	54.86	51.05	27.23	15.99
5	2	1	0.20	2	52.90	49.12	25.47	15.98
5	2	1	0.20	3	62.08	57.92	31.96	16.02
5	2	1	0.50	1	52.26	49.07	27.23	14.61
5	2	1	0.50	2	53.45	49.97	25.47	14.20
5	2	1	0.50	3	56.88	53.71	31.96	14.57
5	2	1	0.75	1	54.27	51.18	27.23	12.90
5	2	1	0.75	2	49.47	46.65	25.47	13.31
5	2	1	0.75	3	60.19	56.89	31.96	13.24
5	2	1	1.00	1	51.16	48.58	27.23	12.08
5	2	1	1.00	2	52.44	49.54	25.47	12.05
5	2	1	1.00	3	56.67	53.99	31.96	12.17
5	2	1	2.00	1	53.28	50.39	25.24	11.49
5	2	1	2.00	2	51.11	48.60	25.14	10.70
5	2	1	2.00	3	51.13	48.55	25.07	10.99
5	2	1	3.50	1	50.05	47.65	25.24	10.71
5	2	1	3.50	2	47.74	45.60	25.14	10.46
5	2	1	3.50	3	50.44	48.00	25.07	10.64
5	2	1	5.00	1	48.15	45.96	25.24	10.57
5	2	1	5.00	2	50.30	47.93	25.14	10.40
5	2	1	5.00	3	47.39	45.29	25.07	10.39
5	2	1	10.00	1	49.40	47.18	25.24	10.12
5	2	1	10.00	2	50.21	47.92	25.14	10.05
5	2	1	10.00	3	49.22	46.96	25.07	10.32
5	2	1	15.00	1	49.02	47.03	25.24	9.13
5	2	1	15.00	2	52.27	49.93	25.14	9.44
5	2	1	15.00	3	47.92	46.01	25.07	9.12
5	2	2	0.10	1	55.31	50.12	26.32	21.81
5	2	2	0.10	2	57.37	51.97	27.61	22.17
5	2	2	0.10	3	52.47	47.71	25.16	21.11
5	2	2	0.20	1	52.90	48.90	26.32	17.71
5	2	2	0.20	2	54.73	50.64	27.61	17.76
5	2	2	0.20	3	55.24	50.73	25.16	17.64
5	2	2	0.50	1	52.38	48.81	26.32	15.87
5	2	2	0.50	2	54.18	50.54	27.61	15.87
5	2	2	0.50	3	53.29	49.42	25.16	15.95
5	2	2	0.75	1	52.87	49.53	26.32	14.39
5	2	2	0.75	2	56.40	52.76	27.61	14.47
5	2	2	0.75	3	52.79	49.26	25.16	14.65
5	2	2	1.00	1	50.62	47.78	26.32	13.23
5	2	2	1.00	2	52.37	49.48	27.61	13.21
5	2	2	1.00	3	52.73	49.46	25.16	13.46

A	B	C	D	E	F	G	H	I
5	2	2	2.00	1	50.06	47.65	26.42	11.35
5	2	2	2.00	2	58.25	55.42	31.19	11.68
5	2	2	2.00	3	52.17	49.50	26.42	11.57
5	2	2	3.50	1	51.12	48.78	26.42	10.47
5	2	2	3.50	2	56.95	54.47	31.19	10.65
5	2	2	3.50	3	51.74	49.32	26.42	10.57
5	2	2	5.00	1	53.08	50.55	26.42	10.48
5	2	2	5.00	2	56.84	54.37	31.19	10.66
5	2	2	5.00	3	53.42	50.79	26.42	10.79
5	2	2	10.00	1	50.42	48.33	26.42	9.54
5	2	2	10.00	2	55.45	53.29	31.19	9.77
5	2	2	10.00	3	50.29	48.21	26.42	9.55
5	2	2	15.00	1	51.21	49.15	26.42	9.06
5	2	2	15.00	2	54.61	52.74	31.19	8.68
5	2	2	15.00	3	49.92	48.03	26.42	8.75

Appendix 6 - Table 7

A - Site along topographic gradient (1 = ridge, 5 = toe of slope)

B - Side of site soil collection made
- 1 - North
- 2 - South

C - Strata
- 1 - Shallow (0-5 cm)
- 2 - Deep (10-15 cm)

D - Pressure (-Mpa)

E - Replicate Number

F - Soil Wet Weight + Can (g)

G - Soil Dry Weight + Can (g)

H - Can Weight (g)

I - %Dry Weight (g)
((Wet wt. - Dry wt.)/Dry wt.)

Appendix 7

Date of grass seed collection and location within the Last Mountain Lake National Wildlife Area for use in the competition experiment.

Species	Date	Location
Agropyron dasystachyum	Aug. 2-9/88	NE29 28 23
Agropyron trachycaulum	Aug. 2-9/88	NE29 28 23
Stipa comata	Aug. 24/88	NW33 28 23
Stipa curtiseta	mid-July/87	E20 28 23
Stipa viridula	July 11/89	NW29 27 23
Bromus inermis	Aug. 17/88	SE29 28 23

Appendix 8

Table 1. Individual means (standard errors) of native grass above-ground biomass competing in monoculture or in mixture with *Bromus inermis* at three moisture levels (Fig. III-2).

	Dry Weight (g)					
	Intraspecific			Interspecific		
Species	Dry	Moist	Wet	Dry	Moist	Wet
Agropyron dasystachyum	.36(.03)	.66(.06)	.84(.08)	.13(.01)	.21(.02)	.25(.02)
A. trachycaulum	.33(.02)	.70(.04)	1.11(.12)	.18(.01)	.25(.02)	.25(.02)
Stipa comata	.41(.03)	.81(.06)	1.07(.07)	.12(.01)	.20(.01)	.25(.02)
S. curtiseta	.26(.02)	.47(.04)	1.02(.07)	.05(.0)	.07(.01)	.09(.01)
S.viridula	.44(.02)	.60(.04)	.99(.06)	.21(.01)	.33(.02)	.35(.02)
Bromus inermis	.55(.05)	.85(.07)	1.07(.07)			

Table 2. Means (standard errors) of biomass production of native grasses competing intraspecifically under two levels of moisture stress, represented as a percentage of biomass production in the wet moisture treatment (Fig. III-3 and 9).

Species	Dry	Moist
Agropyron dasystachyum	40 (4)	89 (15)
A. trachycaulum	34 (4)	74 (10)
Stipa comata	39 (4)	89 (12)
S. curtiseta	28 (3)	52 (7)
S. viridula	47 (3)	66 (6)

Table 3. Means (standard errors) of biomass production of native grasses competing with *Bromus inermis* at three moisture levels, represented as a percentage of monoculture biomass (Fig. III-4, 5, and 9).

Species	Dry	Moist	Wet
Agropyron dasystachyum	38(4)	35(4)	33(4)
A. trachycaulum	50(4)	40(3)	26(3)
Stipa comata	32(4)	29(3)	27(3)
S. curtiseta	23(3)	20(3)	10(1)
S. viridula	51(3)	53(4)	38(3)

Table 4. Means (standard errors) of individual above-ground biomass (g) of *Bromus inermis* competing in monoculture or in mixture with each native grass species at three moisture levels (Fig. III-6).

Competitor	Dry	Moist	Wet
Agropyron dasystachyum	.63 (.04)	1.17 (.06)	1.75 (.10)
A. trachycaulum	.62 (.04)	1.08 (.06)	1.75 (.08)
Stipa comata	.62 (.04)	1.60 (.10)	1.67 (.11)
S. curtiseta	.78 (.05)	1.25 (.07)	1.85 (.14)
S. viridula	.59 (.04)	1.22 (.08)	1.45 (.10)
Bromus inermis	.55 (.05)	.85 (.07)	1.07 (.07)

Table 5. Biomass production of Bromus inermis competing with native grass species at three moisture levels for 119-122 days: represented as percentage of monoculture biomass (Fig. III-7 and 8).

	Treatment		
Species	Dry	Moist	Wet
Agropyron dasystachyum	0.91(.02)	1.2(.05)	1.4(.04)
Agropyron trachycaulum	0.90(.04)	1.1(.04)	1.4(.03)
Stipa comata	0.87(.04)	1.6(.04)	1.2(.03)
Stipa curtiseta	1.1(.03)	1.3(.04)	1.3(.02)
Stipa viridula	0.80(.03)	1.1(.06)	1.1(.02)

Appendix 9

Table 1. Individual data from competition experiment including intraspecific and interspecific data for native grasses and intraspecific data for *Bromus inermis*.

A	B	C	D	E	F	G	H	I
2	1	1	1	1	1	0.369	1	0.410430
2	1	1	1	1	2	0.362	1	0.410430
2	1	1	1	1	3	0.314	1	0.356009
2	1	1	1	1	4	0.300	1	0.340136
2	1	1	1	1	5	0.315	1	0.357142
2	1	1	1	1	6	0.315	1	0.357142
2	1	1	1	1	7	0.882	1	1
2	1	1	1	1	8	0.315	1	0.357142
2	1	1	1	1	9	0.136	1	0.154195
2	1	1	1	1	10	0.335	1	0.379818
2	1	1	1	1	11	0.267	1	0.302721
2	1	1	1	1	12	0.345	1	0.391156
2	1	1	1	1	13	0.578	1	0.655328
2	1	1	1	2	1	0.341	1	0.386621
2	1	1	1	2	2	0.399	1	0.452380
2	1	1	1	2	3	0.195	1	0.221088
2	1	1	1	2	4	0.345	2	0.391156
2	1	1	1	2	5	0.066	1	0.074829
2	1	1	1	2	6	0.126	1	0.142857
2	1	1	1	2	7	0.360	2	0.408163
2	1	1	1	2	8	0.811	1	0.919501
2	1	1	1	2	9	0.341	1	0.386621
2	1	1	1	2	10	0.632	1	0.716553
2	1	1	1	2	11	0.534	1	0.605442
2	1	1	1	2	12	0.597	1	0.676870
2	1	1	1	2	13	0.601	1	0.681405
1	1	1	1	3	1	0.205	1	0.232426
1	1	1	1	3	2	0.120	1	0.136054
1	1	1	1	3	3	0.369	1	0.418367
1	1	1	1	3	4	0.203	1	0.230158
1	1	1	1	3	5	0.330	1	0.374149
1	1	1	1	3	6	0.512	1	0.580498
1	1	1	1	3	7	0.284	1	0.321995
1	1	1	1	3	8	0.357	1	0.404761
1	1	1	1	3	9	0.180	1	0.204081
1	1	1	1	3	10	0.223	1	0.252834
1	1	1	1	3	11	0.119	1	0.134920
1	1	1	1	3	12	0.535	1	0.606575
1	1	1	1	3	13	0.413	1	0.468253
1	1	1	2	1	1	0.415	1	0.270006
1	1	1	2	1	2	0.500	1	0.325309
1	1	1	2	1	3	1.004	1	0.653220
1	1	1	2	1	4	0.947	1	0.616135
1	1	1	2	1	5	0.537	1	0.349381
1	1	1	2	1	6	0.401	1	0.260897
1	1	1	2	1	7	0.745	1	0.484710
1	1	1	2	1	8	0.647	1	0.420949
1	1	1	2	1	9	0.590	1	0.383864
1	1	1	2	1	10	0.403	1	0.262199
1	1	1	2	1	11	0.936	1	0.608978
1	1	1	2	1	12	0.522	1	0.339622
1	1	1	2	1	13	0.287	1	0.186727
2	1	1	2	2	1	0.197	1	0.128171
2	1	1	2	2	2	0.462	1	0.300585
2	1	1	2	2	3	0.380	1	0.247234
2	1	1	2	2	4	1.053	1	0.685100
2	1	1	2	2	5	0.337	1	0.219258
2	1	1	2	2	6	0.507	1	0.329863
2	1	1	2	2	7	0.424	2	0.275862
2	1	1	2	2	8	1.187	1	0.772283
2	1	1	2	2	9	1.074	1	0.698763
2	1	1	2	2	10	0.681	1	0.443070
2	1	1	2	2	11	0.375	1	0.243981
2	1	1	2	2	12	0.542	1	0.352635
2	1	1	2	2	13	1.009	1	0.656473
1	1	1	2	3	1	0.461	1	0.299934
1	1	1	2	3	2	0.805	1	0.523747
1	1	1	2	3	3	1.121	1	0.729342
1	1	1	2	3	4	0.647	1	0.420949
1	1	1	2	3	5	0.045	1	0.029277
1	1	1	2	3	6	0.379	1	0.246584
1	1	1	2	3	7	0.933	1	0.607026
1	1	1	2	3	8	1.439	1	0.936239
1	1	1	2	3	9	0.212	1	0.137931
1	1	1	2	3	10	0.523	1	0.340273
1	1	1	2	3	11	0.753	1	0.489915
1	1	1	2	3	12	1.537	1	1
1	1	1	2	3	13	0.413	1	0.268705
2	1	1	3	1	1	1.080	1	0.533333
2	1	1	3	1	2	0.206	1	0.101728
2	1	1	3	1	3	0.409	1	0.201975
2	1	1	3	1	4	0.791	1	0.390617
2	1	1	3	1	5	0.351	1	0.173333
2	1	1	3	1	6	1.272	1	0.628148
2	1	1	3	1	7	0.295	1	0.145679
2	1	1	3	1	8	1.443	1	0.712592
2	1	1	3	1	9	1.765	1	0.871604
2	1	1	3	1	10	0.510	1	0.251851
2	1	1	3	1	11	1.285	1	0.634567
2	1	1	3	1	12	0.813	1	0.401481
2	1	1	3	1	13	1.386	1	0.684444
2	1	1	3	2	1	1.467	1	0.724444
2	1	1	3	2	2	0.594	1	0.293333
2	1	1	3	2	3	0.113	1	0.055802
2	1	1	3	2	4	0.315	1	0.155555
2	1	1	3	2	5	0.898	1	0.443456
2	1	1	3	2	6	0.357	1	0.176296
2	1	1	3	2	7	1.168	1	0.576790
2	1	1	3	2	8	1.121	1	0.553580
2	1	1	3	2	9	0.616	1	0.304197
2	1	1	3	2	10	0.933	1	0.460740
2	1	1	3	2	11	2.025	1	1
2	1	1	3	2	12	1.147	1	0.566419
2	1	1	3	2	13	1.153	1	0.569382

A	B	C	D	E	F	G	H	I
1	1	1	3	3	1	0.174	1	0.085925
1	1	1	3	3	2	0.337	2	0.166419
1	1	1	3	3	3	0.361	1	0.178271
1	1	1	3	3	4	1.351	1	0.667160
1	1	1	3	3	5	0.100	1	0.049382
1	1	1	3	3	6	0.641	1	0.316543
1	1	1	3	3	7	1.751	1	0.864691
1	1	1	3	3	8	0.237	1	0.117037
1	1	1	3	3	9	0.624	1	0.308148
1	1	1	3	3	10	0.694	1	0.342716
1	1	1	3	3	11	0.498	1	0.245925
1	1	1	3	3	12	1.186	1	0.585679
1	1	1	3	3	13	0.646	1	0.319012
1	1	2	1	1	1	0.090	1	0.102040
1	1	2	1	1	2	0.129	1	0.146258
1	1	2	1	1	3	0.181	1	0.205215
1	1	2	1	1	4	0.095	1	0.107709
1	1	2	1	1	5	0.065	1	0.073696
1	1	2	1	1	6	0.009	1	0.010204
1	1	2	1	1	7	0.182	1	0.206349
1	1	2	1	1	8	0.110	1	0.124716
1	1	2	1	1	9	0.104	1	0.117913
1	1	2	1	1	10	0.129	1	0.146258
1	1	2	1	1	11	0.042	1	0.047619
1	1	2	1	1	12	0.138	1	0.156462
1	1	2	1	1	13	0.071	1	0.080498
2	1	2	1	2	1	0.082	1	0.092970
2	1	2	1	2	2	0.147	1	0.166666
2	1	2	1	2	3	0.121	1	0.137188
2	1	2	1	2	4	0.044	1	0.049886
2	1	2	1	2	5	0.117	1	0.132653
2	1	2	1	2	6	0.110	1	0.124716
2	1	2	1	2	7	0.208	1	0.235827
2	1	2	1	2	8	0.171	1	0.193877
2	1	2	1	2	9	0.205	1	0.232426
2	1	2	1	2	10	0.199	1	0.225623
2	1	2	1	2	11	0.170	1	0.192743
2	1	2	1	2	12	0.129	1	0.146258
2	1	2	1	2	13	0.110	1	0.124716
2	1	2	1	3	1	0.157	1	0.178004
2	1	2	1	3	2	0.089	1	0.100907
2	1	2	1	3	3	0.132	1	0.149659
2	1	2	1	3	4	0.168	1	0.190476
2	1	2	1	3	5	0.132	1	0.149659
2	1	2	1	3	6	0.114	1	0.129251
2	1	2	1	3	7	0.145	1	0.164399
2	1	2	1	3	8	0.168	1	0.190476
2	1	2	1	3	9	0.143	1	0.162131
2	1	2	1	3	10	0.077	1	0.087301
2	1	2	1	3	11	0.210	1	0.238095
2	1	2	1	3	12	0.212	1	0.240362
2	1	2	1	3	13	0.080	1	0.090702
1	1	2	2	1	1	0.177	1	0.115159
1	1	2	2	1	2	0.141	2	0.091737
1	1	2	2	1	3	0.070	1	0.045543
1	1	2	2	1	4	0.163	1	0.106050
1	1	2	2	1	5	0.263	1	0.171112
1	1	2	2	1	6	0.095	1	0.061808
1	1	2	2	1	7	0.151	1	0.098243
1	1	2	2	1	8	0.232	1	0.150943
1	1	2	2	1	9	0.099	1	0.064411
1	1	2	2	1	10	0.194	1	0.126219
1	1	2	2	1	11	0.154	1	0.100195
1	1	2	2	1	12	0.197	1	0.128171
1	1	2	2	1	13	0.136	1	0.088484
2	1	2	2	2	1	0.380	1	0.247234
2	1	2	2	2	2	0.364	1	0.236824
2	1	2	2	2	3	0.287	1	0.186727
2	1	2	2	2	4	0.299	1	0.194534
2	1	2	2	2	5	0.434	1	0.282368
2	1	2	2	2	6	0.284	1	0.184775
2	1	2	2	2	7	0.424	1	0.275862
2	1	2	2	2	8	0.178	1	0.115810
2	1	2	2	2	9	0.408	1	0.265452
2	1	2	2	2	10	0.355	1	0.230969
2	1	2	2	2	11	0.176	1	0.114508
2	1	2	2	2	12	0.049	1	0.031880
2	1	2	2	2	13	0.141	1	0.091737
2	1	2	2	3	1	0.056	1	0.036434
2	1	2	2	3	2	0.233	1	0.151594
2	1	2	2	3	3	0.091	2	0.059206
2	1	2	2	3	4	0.173	1	0.112556
2	1	2	2	3	5	0.228	1	0.148340
2	1	2	2	3	6	0.074	1	0.048145
2	1	2	2	3	7	0.174	1	0.113207
2	1	2	2	3	8	0.138	1	0.089785
2	1	2	2	3	9	0.289	1	0.188028
2	1	2	2	3	10	0.164	1	0.106701
2	1	2	2	3	11	0.321	1	0.208848
2	1	2	2	3	12	0.154	1	0.100195
2	1	2	2	3	13	0.237	1	0.154196
1	1	2	3	1	1	0.340	1	0.167901
1	1	2	3	1	2	0.174	1	0.085925
1	1	2	3	1	3	0.224	1	0.110617
1	1	2	3	1	4	0.202	1	0.099753
1	1	2	3	1	5	0.223	1	0.110123
1	1	2	3	1	6	0.179	1	0.088395
1	1	2	3	1	7	0.153	1	0.075555
1	1	2	3	1	8	0.289	1	0.142716
1	1	2	3	1	9	0.187	1	0.092345
1	1	2	3	1	10	0.155	1	0.076543
1	1	2	3	1	11	0.046	1	0.022716
1	1	2	3	1	12	0.425	1	0.209876
1	1	2	3	1	13	0.116	1	0.057283
2	1	2	3	2	1	0.228	1	0.112592
2	1	2	3	2	2	0.132	1	0.065185
2	1	2	3	2	3	0.397	1	0.196049
2	1	2	3	2	4	0.371	1	0.183209
2	1	2	3	2	5	0.193	1	0.095308
2	1	2	3	2	6	0.313	1	0.154567
2	1	2	3	2	7	0.665	1	0.328395
2	1	2	3	2	8	0.251	1	0.123950
2	1	2	3	2	9	0.303	1	0.149629
2	1	2	3	2	10	0.108	1	0.053333
2	1	2	3	2	11	0.062	1	0.030617
2	1	2	3	2	12	0.276	1	0.136296
2	1	2	3	2	13	0.092	1	0.045432
2	1	2	3	3	1	0.162	1	0.08
2	1	2	3	3	2	0.319	1	0.157530
2	1	2	3	3	3	0.278	1	0.137283
2	1	2	3	3	4	0.396	1	0.195555
2	1	2	3	3	5	0.305	1	0.150617
2	1	2	3	3	6	0.416	1	0.205432
2	1	2	3	3	7	0.331	1	0.163456
2	1	2	3	3	8	0.202	1	0.099753
2	1	2	3	3	9	0.182	1	0.089876
2	1	2	3	3	10	0.130	1	0.064197
2	1	2	3	3	11	0.486	1	0.24
2	1	2	3	3	12	0.093	1	0.045925
2	1	2	3	3	13	0.214	1	0.105679
1	2	1	1	1	1	0.529	1	0.612268
1	2	1	1	1	2	0.345	1	0.399305
1	2	1	1	1	3	0.354	1	0.409722
1	2	1	1	1	4	0.277	1	0.320601
1	2	1	1	1	5	0.274	1	0.317129
1	2	1	1	1	6	0.197	1	0.228009
1	2	1	1	1	7	0.159	1	0.184027
1	2	1	1	1	8	0.296	1	0.342592

A	B	C	D	E	F	G	H	I
1	2	1	1	1	9	0.367	1	0.424768
1	2	1	1	1	10	0.405	1	0.46875
1	2	1	1	1	11	0.408	1	0.472222
1	2	1	1	1	12	0.269	1	0.311342
1	2	1	1	1	13	0.864	1	1
1	2	1	1	2	1	0.236	1	0.273148
1	2	1	1	2	2	0.487	1	0.563657
1	2	1	1	2	3	0.285	1	0.329861
1	2	1	1	2	4	0.331	1	0.383101
1	2	1	1	2	5	0.257	1	0.297453
1	2	1	1	2	6	0.176	1	0.203703
1	2	1	1	2	7	0.413	1	0.478009
1	2	1	1	2	8	0.319	1	0.369212
1	2	1	1	2	9	0.404	1	0.467592
1	2	1	1	2	10	0.287	1	0.332175
1	2	1	1	2	11	0.473	1	0.547453
1	2	1	1	2	12	0.333	1	0.385416
1	2	1	1	2	13	0.235	1	0.271990
2	2	1	1	3	1	0.085	1	0.098379
2	2	1	1	3	2	0.326	1	0.377314
2	2	1	1	3	3	0.397	1	0.459490
2	2	1	1	3	4	0.305	1	0.353009
2	2	1	1	3	5	0.302	1	0.349537
2	2	1	1	3	6	0.284	1	0.328703
2	2	1	1	3	7	0.228	1	0.263888
2	2	1	1	3	8	0.346	1	0.400462
2	2	1	1	3	9	0.458	1	0.530092
2	2	1	1	3	10	0.489	1	0.565972
2	2	1	1	3	11	0.182	1	0.210648
2	2	1	1	3	12	0.307	1	0.355324
2	2	1	1	3	13	0.297	1	0.34375
1	2	1	2	1	1	0.920	1	0.613742
1	2	1	2	1	2	0.923	1	0.615743
1	2	1	2	1	3	0.725	1	0.483655
1	2	1	2	1	4	0.698	1	0.465643
1	2	1	2	1	5	0.967	1	0.645096
1	2	1	2	1	6	0.606	1	0.404269
1	2	1	2	1	7	0.435	1	0.290193
1	2	1	2	1	8	0.441	1	0.294196
1	2	1	2	1	9	0.354	1	0.236157
1	2	1	2	1	10	0.975	1	0.650433
1	2	1	2	1	11	0.711	1	0.474316
1	2	1	2	1	12	0.804	1	0.536357
1	2	1	2	1	13	0.775	1	0.517011
1	2	1	2	2	1	0.671	1	0.447631
1	2	1	2	2	2	0.586	1	0.390927
1	2	1	2	2	3	1.499	1	1
1	2	1	2	2	4	0.714	1	0.476317
1	2	1	2	2	5	0.308	1	0.205470
1	2	1	2	2	6	0.612	1	0.408272
1	2	1	2	2	7	0.610	1	0.406937
1	2	1	2	2	8	0.419	1	0.279519
1	2	1	2	2	9	0.600	1	0.400266
1	2	1	2	2	10	0.661	1	0.440960
1	2	1	2	2	11	0.423	1	0.282188
1	2	1	2	2	12	0.664	1	0.442961
1	2	1	2	2	13	1.063	1	0.709139
2	2	1	2	3	1	1.020	1	0.680453
2	2	1	2	3	2	0.532	1	0.354903
2	2	1	2	3	3	0.742	1	0.494996
2	2	1	2	3	4	0.583	1	0.388925
2	2	1	2	3	5	0.601	1	0.400933
2	2	1	2	3	6	0.414	1	0.276184
2	2	1	2	3	7	0.527	1	0.351567
2	2	1	2	3	8	0.795	1	0.530353
2	2	1	2	3	9	1.023	1	0.682454
2	2	1	2	3	10	0.257	1	0.171447
2	2	1	2	3	11	1.303	1	0.869246
2	2	1	2	3	12	0.933	1	0.622414
2	2	1	2	3	13	0.532	1	0.354903
1	2	1	3	1	1	0.386	1	0.136830
1	2	1	3	1	2	0.969	1	0.343495
1	2	1	3	1	3	0.130	1	0.046082
1	2	1	3	1	4	1.169	1	0.414392
1	2	1	3	1	5	1.379	2	0.488833
1	2	1	3	1	6	1.055	2	0.373980
1	2	1	3	1	7	0.575	2	0.203828
1	2	1	3	1	8	1.005	1	0.356256
1	2	1	3	1	9	0.618	1	0.219071
1	2	1	3	1	10	0.539	1	0.191066
1	2	1	3	1	11	1.302	2	0.461538
1	2	1	3	1	12	0.291	1	0.103154
1	2	1	3	1	13	0.667	1	0.236440
2	2	1	3	2	1	1.553	1	0.550514
2	2	1	3	2	2	1.156	1	0.409783
2	2	1	3	2	3	0.789	1	0.279688
2	2	1	3	2	4	1.000	1	0.354484
2	2	1	3	2	5	2.821	1	1
2	2	1	3	2	6	2.236	1	0.792626
2	2	1	3	2	7	0.980	1	0.347394
2	2	1	3	2	8	1.185	1	0.420063
2	2	1	3	2	9	1.236	1	0.438142
2	2	1	3	2	10	1.863	1	0.660404
2	2	1	3	2	11	5.719	2	2.027295
2	2	1	3	2	12	3.140	2	1.113080
2	2	1	3	2	13	2.558	2	0.906770
2	2	1	3	3	1	1.422	1	0.504076
2	2	1	3	3	2	2.255	2	0.799361
2	2	1	3	3	3	1.929	2	0.683800
2	2	1	3	3	4	0.874	1	0.309819
2	2	1	3	3	5	1.210	1	0.428925
2	2	1	3	3	6	1.340	2	0.475008
2	2	1	3	3	7	1.264	2	0.448068
2	2	1	3	3	8	1.524	2	0.540233
2	2	1	3	3	9	0.683	1	0.242112
2	2	1	3	3	10	1.758	1	0.623183
2	2	1	3	3	11	1.056	1	0.374335
2	2	1	3	3	12	1.209	1	0.428571
2	2	1	3	3	13	2.183	2	0.773839
1	2	2	1	1	1	0.138	1	0.159722
1	2	2	1	1	2	0.162	1	0.1875
1	2	2	1	1	3	0.099	1	0.114583
1	2	2	1	1	4	0.333	1	0.385416
1	2	2	1	1	5	0.343	1	0.396990
1	2	2	1	1	6	0.271	1	0.313657
1	2	2	1	1	7	0.112	1	0.129629
1	2	2	1	1	8	0.166	1	0.192129
1	2	2	1	1	9	0.244	1	0.282407
1	2	2	1	1	10	0.275	1	0.318287
1	2	2	1	1	11	0.237	1	0.274305
1	2	2	1	1	12	0.142	1	0.164351
1	2	2	1	1	13	0.120	1	0.138888
1	2	2	1	2	1	0.226	1	0.261574
1	2	2	1	2	2	0.122	1	0.141203
1	2	2	1	2	3	0.148	1	0.171296
1	2	2	1	2	4	0.239	1	0.276620
1	2	2	1	2	5	0.244	1	0.282407
1	2	2	1	2	6	0.299	1	0.346064
1	2	2	1	2	7	0.099	1	0.114583
1	2	2	1	2	8	0.163	1	0.188657
1	2	2	1	2	9	0.171	1	0.197916
1	2	2	1	2	10	0.167	1	0.193287
1	2	2	1	2	11	0.117	1	0.135416
1	2	2	1	2	12	0.102	1	0.118055
1	2	2	1	2	13	0.070	1	0.081018
2	2	2	1	3	1	0.195	1	0.225694
2	2	2	1	3	2	0.147	1	0.170138
2	2	2	1	3	3	0.196	1	0.226851
2	2	2	1	3	4	0.207	1	0.239583
2	2	2	1	3	5	0.263	1	0.304398

A	B	C	D	E	F	G	H	I
2	2	2	1	3	6	0.186	1	0.215277
2	2	2	1	3	7	0.134	1	0.155092
2	2	2	1	3	8	0.167	1	0.193287
2	2	2	1	3	9	0.178	1	0.206018
2	2	2	1	3	10	0.192	1	0.222222
2	2	2	1	3	11	0.102	1	0.118055
2	2	2	1	3	12	0.087	1	0.100694
2	2	2	1	3	13	0.021	1	0.024305
2	2	2	2	1	1	0.209	1	0.139426
2	2	2	2	1	2	0.176	1	0.117411
2	2	2	2	1	3	0.156	1	0.104069
2	2	2	2	1	4	0.188	1	0.125416
2	2	2	2	1	5	0.169	1	0.112741
2	2	2	2	1	6	0.202	1	0.134756
2	2	2	2	1	7	0.119	1	0.079386
2	2	2	2	1	8	0.157	1	0.104736
2	2	2	2	1	9	0.099	1	0.066044
2	2	2	2	1	10	0.138	1	0.092061
2	2	2	2	1	11	0.172	1	0.114743
2	2	2	2	1	12	0.364	1	0.242828
2	2	2	2	1	13	0.149	1	0.099399
1	2	2	2	2	1	0.244	1	0.162775
1	2	2	2	2	2	0.269	1	0.179452
1	2	2	2	2	3	0.404	1	0.269513
1	2	2	2	2	4	0.166	1	0.110740
1	2	2	2	2	5	0.240	1	0.160106
1	2	2	2	2	6	0.362	1	0.241494
1	2	2	2	2	7	0.359	1	0.239492
1	2	2	2	2	8	0.265	1	0.176784
1	2	2	2	2	9	0.317	1	0.211474
1	2	2	2	2	10	0.387	1	0.258172
1	2	2	2	2	11	0.261	1	0.174116
1	2	2	2	2	12	0.246	1	0.164109
1	2	2	2	2	13	0.513	1	0.342228
2	2	2	2	3	1	0.271	1	0.180787
2	2	2	2	3	2	0.256	1	0.170780
2	2	2	2	3	3	0.255	1	0.170113
2	2	2	2	3	4	0.273	1	0.182121
2	2	2	2	3	5	0.255	1	0.170113
2	2	2	2	3	6	0.182	1	0.121414
2	2	2	2	3	7	0.328	1	0.218812
2	2	2	2	3	8	0.361	1	0.240827
2	2	2	2	3	9	0.390	1	0.260173
2	2	2	2	3	10	0.180	1	0.120080
2	2	2	2	3	11	0.390	1	0.260173
2	2	2	2	3	12	0.334	1	0.222815
2	2	2	2	3	13	0.117	1	0.078052
1	2	2	3	1	1	0.270	1	0.095710
1	2	2	3	1	2	0.189	1	0.066997
1	2	2	3	1	3	0.167	1	0.059198
1	2	2	3	1	4	0.155	1	0.054945
1	2	2	3	1	5	0.419	1	0.148528
1	2	2	3	1	6	0.241	1	0.085430
1	2	2	3	1	7	0.175	1	0.062034
1	2	2	3	1	8	0.262	1	0.092874
1	2	2	3	1	9	0.150	1	0.053172
1	2	2	3	1	10	0.252	1	0.089330
1	2	2	3	1	11	0.109	1	0.038638
1	2	2	3	1	12	0.170	1	0.060262
1	2	2	3	1	13	0.171	1	0.060616
1	2	2	3	2	1	0.172	1	0.060971
1	2	2	3	2	2	0.162	1	0.057426
1	2	2	3	2	3	0.150	1	0.053172
1	2	2	3	2	4	0.259	1	0.091811
1	2	2	3	2	5	0.248	1	0.087912
1	2	2	3	2	6	0.198	1	0.070187
1	2	2	3	2	7	0.153	1	0.054236
1	2	2	3	2	8	0.209	1	0.074087
1	2	2	3	2	9	0.175	1	0.062034

A	B	C	D	E	F	G	H	I
1	2	2	3	2	10	0.345	1	0.122297
1	2	2	3	2	11	0.222	1	0.078695
1	2	2	3	2	12	0.285	1	0.101028
1	2	2	3	2	13	0.262	1	0.092874
2	2	2	3	3	1	0.257	1	0.091102
2	2	2	3	3	2	0.173	1	0.061325
2	2	2	3	3	3	0.300	1	0.106345
2	2	2	3	3	4	0.345	1	0.122297
2	2	2	3	3	5	0.543	1	0.192484
2	2	2	3	3	6	0.343	1	0.121588
2	2	2	3	3	7	0.593	1	0.210209
2	2	2	3	3	8	0.497	1	0.176178
2	2	2	3	3	9	0.111	1	0.039347
2	2	2	3	3	10	0.405	1	0.143566
2	2	2	3	3	11	0.349	1	0.123714
2	2	2	3	3	12	0.209	1	0.074087
2	2	2	3	3	13	0.153	1	0.054236
1	3	1	1	1	1	0.235	1	0
1	3	1	1	1	2	0.546	1	0
1	3	1	1	1	3	0.662	1	0
1	3	1	1	1	4	0.692	1	0
1	3	1	1	1	5	0.664	1	0
1	3	1	1	1	6	0.661	1	0
1	3	1	1	1	7	0.259	1	0
1	3	1	1	1	8	0.412	1	0
1	3	1	1	1	9	0.247	1	0
1	3	1	1	1	10	0.357	1	0
1	3	1	1	1	11	0.310	1	0
1	3	1	1	1	12	0.462	1	0
1	3	1	1	1	13	0.473	1	0
2	3	1	1	2	1	0.480	1	0
2	3	1	1	2	2	0.669	1	0
2	3	1	1	2	3	0.556	1	0
2	3	1	1	2	4	1.222	1	0
2	3	1	1	2	5	0.715	1	0
2	3	1	1	2	6	0.655	1	0
2	3	1	1	2	7	0.763	1	0
2	3	1	1	2	8	0.434	1	0
2	3	1	1	2	9	0.664	1	0
2	3	1	1	2	10	0.310	1	0
2	3	1	1	2	11	0.392	1	0
2	3	1	1	2	12	1.015	1	0
2	3	1	1	2	13	0.400	1	0
1	3	1	2	1	1	0.654	1	0
1	3	1	2	1	2	0.926	1	0
1	3	1	2	1	3	1.005	1	0
1	3	1	2	1	4	0.389	1	0
1	3	1	2	1	5	0.353	1	0
1	3	1	2	1	6	0.742	1	0
1	3	1	2	1	7	1.672	1	0
1	3	1	2	1	8	1.069	1	0
1	3	1	2	1	9	0.320	1	0
1	3	1	2	1	10	1.016	1	0
1	3	1	2	1	11	0.458	1	0
1	3	1	2	1	12	0.641	1	0
1	3	1	2	1	13	1.099	1	0
2	3	1	2	2	1	0.881	1	0
2	3	1	2	2	2	0.995	1	0
2	3	1	2	2	3	0.491	1	0
2	3	1	2	2	4	1.094	1	0
2	3	1	2	2	5	0.933	1	0
2	3	1	2	2	6	0.779	1	0
2	3	1	2	2	7	0.465	1	0
2	3	1	2	2	8	1.562	1	0
2	3	1	2	2	9	0.907	1	0
2	3	1	2	2	10	0.695	1	0
2	3	1	2	2	11	0.847	1	0
2	3	1	2	2	12	1.301	1	0
2	3	1	2	2	13	0.770	1	0

A	B	C	D	E	F	G	H	I
1	3	1	3	1	1	0.792	1	0
1	3	1	3	1	2	1.622	1	0
1	3	1	3	1	3	0.935	1	0
1	3	1	3	1	4	1.409	1	0
1	3	1	3	1	5	0.705	1	0
1	3	1	3	1	6	1.463	1	0
1	3	1	3	1	7	0.474	1	0
1	3	1	3	1	8	1.306	1	0
1	3	1	3	1	9	0.454	1	0
1	3	1	3	1	10	0.387	1	0
1	3	1	3	1	11	1.012	1	0
1	3	1	3	1	12	1.097	1	0
1	3	1	3	1	13	1.008	1	0
2	3	1	3	2	1	1.314	1	0
2	3	1	3	2	2	1.734	1	0
2	3	1	3	2	3	1.488	1	0
2	3	1	3	2	4	0.842	1	0
2	3	1	3	2	5	0.689	1	0
2	3	1	3	2	6	1.416	1	0
2	3	1	3	2	7	1.291	1	0
2	3	1	3	2	8	1.286	1	0
2	3	1	3	2	9	0.741	1	0
2	3	1	3	2	10	1.261	1	0
2	3	1	3	2	11	0.785	1	0
2	3	1	3	2	12	1.343	1	0
2	3	1	3	2	13	1.045	1	0
1	4	1	1	1	1	0.318	1	0.365517
1	4	1	1	1	2	0.337	1	0.387356
1	4	1	1	1	3	0.475	1	0.545977
1	4	1	1	1	4	0.521	1	0.598850
1	4	1	1	1	5	0.135	1	0.155172
1	4	1	1	1	6	0.768	1	0.882758
1	4	1	1	1	7	0.664	1	0.763218
1	4	1	1	1	8	0.24	1	0.275862
1	4	1	1	1	9	0.526	1	0.604597
1	4	1	1	1	10	0.115	1	0.132183
1	4	1	1	1	11	0.543	1	0.624137
1	4	1	1	1	12	0.5	1	0.574712
1	4	1	1	1	13	0.576	1	0.662068
1	4	1	1	2	1	0.067	1	0.077011
1	4	1	1	2	2	0.183	1	0.210344
1	4	1	1	2	3	0.593	1	0.681609
1	4	1	1	2	4	0.394	1	0.452873
1	4	1	1	2	5	0.396	1	0.455172
1	4	1	1	2	6	0.227	1	0.260919
1	4	1	1	2	7	0.159	1	0.182758
1	4	1	1	2	8	0.424	1	0.487356
1	4	1	1	2	9	0.324	1	0.372413
1	4	1	1	2	10	0.87	1	1
1	4	1	1	2	11	0.031	1	0.035632
1	4	1	1	2	12	0.534	1	0.613793
1	4	1	1	2	13	0.736	1	0.845977
1	4	1	1	3	1	0.137	1	0.157471
1	4	1	1	3	2	0.316	1	0.363218
1	4	1	1	3	3	0.332	1	0.381609
1	4	1	1	3	4	0.461	1	0.529885
1	4	1	1	3	5	0.559	1	0.642528
1	4	1	1	3	6	0.561	1	0.644827
1	4	1	1	3	7	0.559	1	0.642528
1	4	1	1	3	8	0.229	1	0.263218
1	4	1	1	3	9	0.21	1	0.241379
1	4	1	1	3	10	0.424	1	0.487356
1	4	1	1	3	11	0.665	1	0.764367
1	4	1	1	3	12	0.344	1	0.395402
1	4	1	1	3	13	0.689	1	0.791954
1	4	1	2	1	1	0.997	1	0.555741
1	4	1	2	1	2	0.747	1	0.416387
1	4	1	2	1	3	0.858	1	0.478260
1	4	1	2	1	4	1.106	1	0.616499
1	4	1	2	1	5	1.384	1	0.771460
1	4	1	2	1	6	0.725	1	0.404124
1	4	1	2	1	7	0.64	1	0.356744
1	4	1	2	1	8	1.125	1	0.627090
1	4	1	2	1	9	1.02	1	0.568561
1	4	1	2	1	10	1.026	1	0.571906
1	4	1	2	1	11	1.115	1	0.621516
1	4	1	2	1	12	0.979	1	0.545707
1	4	1	2	1	13	0.233	1	0.129877
1	4	1	2	2	1	1.163	1	0.648272
1	4	1	2	2	2	0.459	1	0.255852
1	4	1	2	2	3	0.594	1	0.331103
1	4	1	2	2	4	0.839	1	0.467670
1	4	1	2	2	5	0.469	1	0.261426
1	4	1	2	2	6	0.131	1	0.073021
1	4	1	2	2	7	1.004	1	0.559643
1	4	1	2	2	8	0.331	1	0.184503
1	4	1	2	2	9	0.843	1	0.469899
1	4	1	2	2	10	0.49	1	0.273132
1	4	1	2	2	11	0.272	1	0.151616
1	4	1	2	2	12	0.629	1	0.350613
1	4	1	2	2	13	0.37	1	0.206243
1	4	1	2	3	1	1.794	1	1
1	4	1	2	3	2	1.297	1	0.722965
1	4	1	2	3	3	0.619	1	0.345039
1	4	1	2	3	4	1.154	1	0.643255
1	4	1	2	3	5	0.845	1	0.471014
1	4	1	2	3	6	0.72	1	0.401337
1	4	1	2	3	7	0.645	1	0.359531
1	4	1	2	3	8	0.602	1	0.335562
1	4	1	2	3	9	0.863	1	0.481047
1	4	1	2	3	10	0.437	1	0.243589
1	4	1	2	3	11	1.1	1	0.613154
1	4	1	2	3	12	1.294	1	0.721293
1	4	1	2	3	13	0.719	1	0.400780
1	4	1	3	1	1	0.766	1	0.335376
1	4	1	3	1	2	1.443	1	0.631786
1	4	1	3	1	3	0.961	1	0.420753
1	4	1	3	1	4	0.828	1	0.362521
1	4	1	3	1	5	0.443	1	0.193957
1	4	1	3	1	6	1.736	1	0.760070
1	4	1	3	1	7	0.762	1	0.333625
1	4	1	3	1	8	1.027	1	0.449649
1	4	1	3	1	9	0.398	1	0.174255
1	4	1	3	1	10	1.54	1	0.674255
1	4	1	3	1	11	1.044	1	0.457092
1	4	1	3	1	12	1.364	1	0.597197
1	4	1	3	1	13	0.957	1	0.419001
1	4	1	3	2	1	1.429	1	0.625656
1	4	1	3	2	2	0.492	1	0.215411
1	4	1	3	2	3	0.655	1	0.286777
1	4	1	3	2	4	0.331	1	0.144921
1	4	1	3	2	5	0.798	1	0.349387
1	4	1	3	2	6	1.466	1	0.641856
1	4	1	3	2	7	0.848	1	0.371278
1	4	1	3	2	8	0.823	1	0.360332
1	4	1	3	2	9	1.132	1	0.495621
1	4	1	3	2	10	0.707	1	0.309544
1	4	1	3	2	11	1.04	1	0.455341
1	4	1	3	2	12	1.027	1	0.449649
1	4	1	3	2	13	1.1	1	0.481611
1	4	1	3	3	1	0.847	1	0.370840
1	4	1	3	3	2	0.508	1	0.222416
1	4	1	3	3	3	1.253	1	0.548598
1	4	1	3	3	4	2.284	1	1
1	4	1	3	3	5	1.272	1	0.556917
1	4	1	3	3	6	1.869	1	0.818301
1	4	1	3	3	7	1.635	1	0.715849

A	B	C	D	E	F	G	H	I
1	4	1	3	3	8	1.221	1	0.534588
1	4	1	3	3	9	1.877	1	0.821803
1	4	1	3	3	10	1.294	1	0.566549
1	4	1	3	3	11	0.898	1	0.393169
1	4	1	3	3	12	1.328	1	0.581436
1	4	1	3	3	13	0.194	1	0.084938
1	4	2	1	1	1	0.084	1	0.096551
1	4	2	1	1	2	0.21	1	0.241379
1	4	2	1	1	3	0.024	1	0.027586
1	4	2	1	1	4	0.08	1	0.091954
1	4	2	1	1	5	0.223	1	0.256321
1	4	2	1	1	6	0.08	1	0.091954
1	4	2	1	1	7	0.244	1	0.280459
1	4	2	1	1	8	0.172	1	0.197701
1	4	2	1	1	9	0.228	1	0.262068
1	4	2	1	1	10	0.083	1	0.095402
1	4	2	1	1	11	0.039	1	0.044827
1	4	2	1	1	12	0.122	1	0.140229
1	4	2	1	1	13	0.246	1	0.282758
1	4	2	1	2	1	0.063	1	0.072413
1	4	2	1	2	2	0.165	1	0.189655
1	4	2	1	2	3	0.189	1	0.217241
1	4	2	1	2	4	0.043	1	0.049425
1	4	2	1	2	5	0.106	1	0.121839
1	4	2	1	2	6	0.087	1	0.1
1	4	2	1	2	7	0.2	1	0.229885
1	4	2	1	2	8	0.238	1	0.273563
1	4	2	1	2	9	0.059	1	0.067816
1	4	2	1	2	10	0.024	1	0.027586
1	4	2	1	2	11	0.183	1	0.210344
1	4	2	1	2	12	0.11	1	0.126436
1	4	2	1	2	13	0.092	1	0.105747
1	4	2	1	3	1	0.091	1	0.104597
1	4	2	1	3	2	0.224	1	0.257471
1	4	2	1	3	3	0.17	1	0.195402
1	4	2	1	3	4	0.198	1	0.227586
1	4	2	1	3	5	0.089	1	0.102298
1	4	2	1	3	6	0.09	1	0.103448
1	4	2	1	3	7	0.035	1	0.040229
1	4	2	1	3	8	0.088	1	0.101149
1	4	2	1	3	9	0.131	1	0.150574
1	4	2	1	3	10	0.051	1	0.058620
1	4	2	1	3	11	0.131	1	0.150574
1	4	2	1	3	12	0.114	1	0.131034
1	4	2	1	3	13	0.042	1	0.048275
1	4	2	2	1	1	0.109	1	0.060758
1	4	2	2	1	2	0.153	1	0.085284
1	4	2	2	1	3	0.313	1	0.174470
1	4	2	2	1	4	0.131	1	0.073021
1	4	2	2	1	5	0.095	1	0.052954
1	4	2	2	1	6	0.179	1	0.099777
1	4	2	2	1	7	0.286	1	0.159420
1	4	2	2	1	8	0.412	1	0.229654
1	4	2	2	1	9	0.22	1	0.122630
1	4	2	2	1	10	0.126	1	0.070234
1	4	2	2	1	11	0.191	1	0.106465
1	4	2	2	1	12	0.346	1	0.192865
1	4	2	2	1	13	0.086	1	0.047937
1	4	2	2	2	1	0.203	1	0.113154
1	4	2	2	2	2	0.134	1	0.074693
1	4	2	2	2	3	0.269	1	0.149944
1	4	2	2	2	4	0.315	1	0.175585
1	4	2	2	2	5	0.154	1	0.085841
1	4	2	2	2	6	0.201	1	0.112040
1	4	2	2	2	7	0.165	1	0.091973
1	4	2	2	2	8	0.212	1	0.118171
1	4	2	2	2	9	0.3	1	0.167224
1	4	2	2	2	10	0.26	1	0.144927
1	4	2	2	2	11	0.195	1	0.108695
1	4	2	2	2	12	0.063	1	0.035117
1	4	2	2	2	13	0.098	1	0.054626
1	4	2	2	3	1	0.238	1	0.132664
1	4	2	2	3	2	0.119	1	0.066332
1	4	2	2	3	3	0.271	1	0.151059
1	4	2	2	3	4	0.082	1	0.045707
1	4	2	2	3	5	0.158	1	0.088071
1	4	2	2	3	6	0.239	1	0.133221
1	4	2	2	3	7	0.27	1	0.150501
1	4	2	2	3	8	0.233	1	0.129877
1	4	2	2	3	9	0.167	1	0.093088
1	4	2	2	3	10	0.207	1	0.115384
1	4	2	2	3	11	0.191	1	0.106465
1	4	2	2	3	12	0.174	1	0.096989
1	4	2	2	3	13	0.237	1	0.132107
1	4	2	3	1	1	0.04	1	0.017513
1	4	2	3	1	2	0.137	1	0.059982
1	4	2	3	1	3	0.47	1	0.205779
1	4	2	3	1	4	0.253	1	0.110770
1	4	2	3	1	5	0.234	1	0.102451
1	4	2	3	1	6	0.263	1	0.115148
1	4	2	3	1	7	0.382	1	0.167250
1	4	2	3	1	8	0.255	1	0.111646
1	4	2	3	1	9	0.22	1	0.096322
1	4	2	3	1	10	0.225	1	0.098511
1	4	2	3	1	11	0.299	1	0.130910
1	4	2	3	1	12	0.347	1	0.151926
1	4	2	3	1	13	0.291	1	0.127408
1	4	2	3	2	1	0.251	1	0.109894
1	4	2	3	2	2	0.124	1	0.054290
1	4	2	3	2	3	0.193	1	0.084500
1	4	2	3	2	4	0.103	1	0.045096
1	4	2	3	2	5	0.108	1	0.047285
1	4	2	3	2	6	0.134	1	0.058669
1	4	2	3	2	7	0.182	1	0.079684
1	4	2	3	2	8	0.105	1	0.045971
1	4	2	3	2	9	0.416	1	0.182136
1	4	2	3	2	10	0.236	1	0.103327
1	4	2	3	2	11	0.116	1	0.050788
1	4	2	3	2	12	0.099	1	0.043345
1	4	2	3	2	13	0.089	1	0.038966
1	4	2	3	3	1	0.287	1	0.125656
1	4	2	3	3	2	0.569	1	0.249124
1	4	2	3	3	3	0.361	1	0.158056
1	4	2	3	3	4	0.21	1	0.091943
1	4	2	3	3	5	0.373	1	0.163309
1	4	2	3	3	6	0.482	1	0.211033
1	4	2	3	3	7	0.383	1	0.167688
1	4	2	3	3	8	0.194	1	0.084938
1	4	2	3	3	9	0.101	1	0.044220
1	4	2	3	3	10	0.322	1	0.140980
1	4	2	3	3	11	0.481	1	0.210595
1	4	2	3	3	12	0.21	1	0.091943
1	4	2	3	3	13	0.098	1	0.042907
1	5	1	1	1	1	0.319	1	0.555749
1	5	1	1	1	2	0.276	1	0.480836
1	5	1	1	1	3	0.136	1	0.236933
1	5	1	1	1	4	0.574	1	1
1	5	1	1	1	5	0.031	1	0.054006
1	5	1	1	1	6	0.343	1	0.597560
1	5	1	1	1	7	0.305	1	0.531358
1	5	1	1	1	8	0.239	1	0.416376
1	5	1	1	1	9	0.080	1	0.139372

A	B	C	D	E	F	G	H	I
1	5	1	1	1	10	0.362	1	0.630662
1	5	1	1	1	11	0.324	1	0.564459
1	5	1	1	1	12	0.196	1	0.341463
1	5	1	1	1	13	0.217	1	0.378048
2	5	1	1	2	1	0.188	1	0.327526
2	5	1	1	2	2	0.152	1	0.264808
2	5	1	1	2	3	0.436	1	0.759581
2	5	1	1	2	4	0.220	1	0.383275
2	5	1	1	2	5	0.306	1	0.533101
2	5	1	1	2	6	0.097	1	0.168989
2	5	1	1	2	7	0.134	1	0.233449
2	5	1	1	2	8	0.039	1	0.067944
2	5	1	1	2	9	0.380	1	0.662020
2	5	1	1	2	10	0.028	1	0.048780
2	5	1	1	2	11	0.115	1	0.200348
2	5	1	1	2	12	0.257	1	0.447735
2	5	1	1	2	13	0.359	1	0.625435
1	5	1	1	3	1	0.328	1	0.571428
1	5	1	1	3	2	0.204	1	0.355400
1	5	1	1	3	3	0.240	1	0.418118
1	5	1	1	3	4	0.065	1	0.113240
1	5	1	1	3	5	0.339	1	0.590592
1	5	1	1	3	6	0.426	1	0.742160
1	5	1	1	3	7	0.130	1	0.226480
1	5	1	1	3	8	0.406	1	0.707317
1	5	1	1	3	9	0.376	1	0.655052
1	5	1	1	3	10	0.484	1	0.843205
1	5	1	1	3	11	0.173	1	0.301393
1	5	1	1	3	12	0.466	1	0.811846
1	5	1	1	3	13	0.275	1	0.479094
2	5	1	2	1	1	0.452	1	0.401777
2	5	1	2	1	2	0.728	1	0.647111
2	5	1	2	1	3	0.431	1	0.383111
2	5	1	2	1	4	0.343	1	0.304888
2	5	1	2	1	5	0.287	1	0.255111
2	5	1	2	1	6	0.817	1	0.726222
2	5	1	2	1	7	0.155	1	0.137777
2	5	1	2	1	8	1.125	1	1
2	5	1	2	1	9	0.554	1	0.492444
2	5	1	2	1	10	0.393	1	0.349333
2	5	1	2	1	11	0.303	1	0.269333
2	5	1	2	1	12	0.613	1	0.544888
2	5	1	2	1	13	0.566	1	0.503111
2	5	1	2	2	1	0.475	1	0.422222
2	5	1	2	2	2	0.431	1	0.383111
2	5	1	2	2	3	0.065	1	0.057777
2	5	1	2	2	4	0.108	1	0.096
2	5	1	2	2	5	0.536	1	0.476444
2	5	1	2	2	6	0.208	1	0.184888
2	5	1	2	2	7	0.697	1	0.619555
2	5	1	2	2	8	0.237	1	0.210666
2	5	1	2	2	9	0.284	1	0.252444
2	5	1	2	2	10	0.339	1	0.301333
2	5	1	2	2	11	0.615	1	0.546666
2	5	1	2	2	12	0.084	1	0.074666
2	5	1	2	2	13	0.557	1	0.495111
1	5	1	2	3	1	0.404	1	0.359111
1	5	1	2	3	2	0.479	1	0.425777
1	5	1	2	3	3	0.507	1	0.450666
1	5	1	2	3	4	0.856	1	0.760888
1	5	1	2	3	5	0.834	1	0.741333
1	5	1	2	3	6	0.600	1	0.533333
1	5	1	2	3	7	0.466	1	0.414222
1	5	1	2	3	8	0.491	1	0.436444
1	5	1	2	3	9	0.674	1	0.599111
1	5	1	2	3	10	0.043	1	0.038222
1	5	1	2	3	11	0.430	1	0.382222
1	5	1	2	3	12	0.507	1	0.450666
1	5	1	2	3	13	0.666	1	0.592
1	5	1	3	1	1	0.752	1	0.394750
1	5	1	3	1	2	0.567	1	0.297637
1	5	1	3	1	3	0.689	1	0.361679
1	5	1	3	1	4	0.680	1	0.356955
1	5	1	3	1	5	1.572	1	0.825196
1	5	1	3	1	6	1.223	1	0.641994
1	5	1	3	1	7	0.741	1	0.388976
1	5	1	3	1	8	1.083	1	0.568503
1	5	1	3	1	9	0.838	1	0.439895
1	5	1	3	1	10	1.905	1	1
1	5	1	3	1	11	0.984	1	0.516535
1	5	1	3	1	12	1.070	1	0.561679
1	5	1	3	1	13	1.075	1	0.564304
1	5	1	3	2	1	0.834	1	0.437795
1	5	1	3	2	2	0.382	1	0.200524
1	5	1	3	2	3	0.023	1	0.012073
1	5	1	3	2	4	1.102	1	0.578477
1	5	1	3	2	5	1.289	1	0.676640
1	5	1	3	2	6	0.939	1	0.492913
1	5	1	3	2	7	1.387	1	0.728083
1	5	1	3	2	8	0.881	1	0.462467
1	5	1	3	2	9	1.650	1	0.866141
1	5	1	3	2	10	1.886	1	0.990026
1	5	1	3	2	11	1.593	1	0.836220
1	5	1	3	2	12	1.413	1	0.741732
1	5	1	3	2	13	0.661	1	0.346981
1	5	1	3	3	1	0.871	1	0.457217
1	5	1	3	3	2	1.353	1	0.710236
1	5	1	3	3	3	1.415	1	0.742782
1	5	1	3	3	4	0.775	1	0.406824
1	5	1	3	3	5	0.525	1	0.275590
1	5	1	3	3	6	0.052	1	0.027296
1	5	1	3	3	7	1.469	1	0.771128
1	5	1	3	3	8	0.810	1	0.425196
1	5	1	3	3	9	0.893	1	0.468766
1	5	1	3	3	10	1.096	1	0.575328
1	5	1	3	3	11	1.358	1	0.712860
1	5	1	3	3	12	1.034	1	0.542782
1	5	1	3	3	13	0.752	1	0.394750
1	5	2	1	1	1	0.041	1	0.071428
1	5	2	1	1	2	0.014	1	0.024390
1	5	2	1	1	3	0.022	1	0.038327
1	5	2	1	1	4	0.024	1	0.041811
1	5	2	1	1	5	0.033	1	0.057491
1	5	2	1	1	6	0.065	1	0.113240
1	5	2	1	1	7	0.022	1	0.038327
1	5	2	1	1	8	0.014	1	0.024390
1	5	2	1	1	9	0.056	1	0.097560
1	5	2	1	1	10	0.023	1	0.040069
1	5	2	1	1	11	0.050	1	0.087108
1	5	2	1	1	12	0.046	1	0.080139
1	5	2	1	1	13	0.039	1	0.067944
2	5	2	1	2	1	0.021	1	0.036585
2	5	2	1	2	2	0.019	1	0.033101
2	5	2	1	2	3	0.120	1	0.209059
2	5	2	1	2	4	0.021	1	0.036585
2	5	2	1	2	5	0.073	1	0.127177
2	5	2	1	2	6	0.048	1	0.083623
2	5	2	1	2	7	0.048	1	0.083623
2	5	2	1	2	8	0.116	1	0.202090
2	5	2	1	2	9	0.012	1	0.020905
2	5	2	1	2	10	0.084	1	0.146341
2	5	2	1	2	11	0.078	1	0.135888

A	B	C	D	E	F	G	H	I
2	5	2	1	2	12	0.027	1	0.047038
2	5	2	1	2	13	0.039	1	0.067944
2	5	2	1	3	1	0.039	1	0.067944
2	5	2	1	3	2	0.087	1	0.151567
2	5	2	1	3	3	0.072	1	0.125435
2	5	2	1	3	4	0.061	1	0.106271
2	5	2	1	3	5	0.009	1	0.015679
2	5	2	1	3	6	0.044	1	0.076655
2	5	2	1	3	7	0.015	1	0.026132
2	5	2	1	3	8	0.056	1	0.097560
2	5	2	1	3	9	0.060	1	0.104529
2	5	2	1	3	10	0.048	1	0.083623
2	5	2	1	3	11	0.057	1	0.099303
2	5	2	1	3	12	0.087	1	0.151567
2	5	2	1	3	13	0.072	1	0.125435
1	5	2	2	1	1	0.074	1	0.065777
1	5	2	2	1	2	0.061	1	0.054222
1	5	2	2	1	3	0.027	1	0.024
1	5	2	2	1	4	0.032	1	0.028444
1	5	2	2	1	5	0.074	1	0.065777
1	5	2	2	1	6	0.088	1	0.078222
1	5	2	2	1	7	0.044	1	0.039111
1	5	2	2	1	8	0.051	1	0.045333
1	5	2	2	1	9	0.070	1	0.062222
1	5	2	2	1	10	0.040	1	0.035555
1	5	2	2	1	11	0.167	1	0.148444
1	5	2	2	1	12	0.120	1	0.106666
1	5	2	2	1	13	0.078	1	0.069333
1	5	2	2	2	1	0.095	1	0.084444
1	5	2	2	2	2	0.023	1	0.020444
1	5	2	2	2	3	0.117	1	0.104
1	5	2	2	2	4	0.089	1	0.079111
1	5	2	2	2	5	0.037	1	0.032888
1	5	2	2	2	6	0.064	1	0.056888
1	5	2	2	2	7	0.053	1	0.047111
1	5	2	2	2	8	0.081	1	0.072
1	5	2	2	2	9	0.047	1	0.041777
1	5	2	2	2	10	0.094	1	0.083555
1	5	2	2	2	11	0.123	1	0.109333
1	5	2	2	2	12	0.063	1	0.056
1	5	2	2	2	13	0.140	1	0.124444
2	5	2	2	3	1	0.068	1	0.060444
2	5	2	2	3	2	0.032	1	0.028444
2	5	2	2	3	3	0.006	1	0.005333
2	5	2	2	3	4	0.063	1	0.056
2	5	2	2	3	5	0.075	1	0.066666
2	5	2	2	3	6	0.090	1	0.08
2	5	2	2	3	7	0.097	1	0.086222
2	5	2	2	3	8	0.054	1	0.048
2	5	2	2	3	9	0.038	1	0.033777
2	5	2	2	3	10	0.093	1	0.082666
2	5	2	2	3	11	0.074	1	0.065777
2	5	2	2	3	12	0.054	1	0.048
2	5	2	2	3	13	0.090	1	0.08
1	5	2	3	1	1	0.169	1	0.088713
1	5	2	3	1	2	0.071	1	0.037270
1	5	2	3	1	3	0.131	1	0.068766
1	5	2	3	1	4	0.049	1	0.025721
1	5	2	3	1	5	0.047	1	0.024671
1	5	2	3	1	6	0.015	1	0.007874
1	5	2	3	1	7	0.053	1	0.027821
1	5	2	3	1	8	0.087	1	0.045669
1	5	2	3	1	9	0.097	1	0.050918
1	5	2	3	1	10	0.220	1	0.115485
1	5	2	3	1	11	0.098	1	0.051443
1	5	2	3	1	12	0.098	1	0.051443
1	5	2	3	1	13	0.101	1	0.053018
1	5	2	3	2	1	0.123	1	0.064566
1	5	2	3	2	2	0.118	1	0.061942
1	5	2	3	2	3	0.025	1	0.013123
1	5	2	3	2	4	0.063	1	0.033070
1	5	2	3	2	5	0.101	1	0.053018
1	5	2	3	2	6	0.016	1	0.008398
1	5	2	3	2	7	0.070	1	0.036745
1	5	2	3	2	8	0.170	1	0.089238
1	5	2	3	2	9	0.142	1	0.074540
1	5	2	3	2	10	0.157	1	0.082414
1	5	2	3	2	11	0.102	1	0.053543
1	5	2	3	2	12	0.088	1	0.046194
1	5	2	3	2	13	0.129	1	0.067716
2	5	2	3	3	1	0.073	1	0.038320
2	5	2	3	3	2	0.067	1	0.035170
2	5	2	3	3	3	0.049	1	0.025721
2	5	2	3	3	4	0.060	1	0.031496
2	5	2	3	3	5	0.093	1	0.048818
2	5	2	3	3	6	0.074	1	0.038845
2	5	2	3	3	7	0.087	1	0.045669
2	5	2	3	3	8	0.059	1	0.030971
2	5	2	3	3	9	0.084	1	0.044094
2	5	2	3	3	10	0.180	1	0.094488
2	5	2	3	3	11	0.110	1	0.057742
2	5	2	3	3	12	0.091	1	0.047769
2	5	2	3	3	13	0.048	1	0.025196
1	6	1	1	1	1	0.333	1	0.444
1	6	1	1	1	2	0.543	1	0.724
1	6	1	1	1	3	0.431	1	0.574666
1	6	1	1	1	4	0.510	1	0.68
1	6	1	1	1	5	0.219	1	0.292
1	6	1	1	1	6	0.610	1	0.813333
1	6	1	1	1	7	0.546	1	0.728
1	6	1	1	1	8	0.417	1	0.556
1	6	1	1	1	9	0.440	1	0.586666
1	6	1	1	1	10	0.425	1	0.566666
1	6	1	1	1	11	0.543	1	0.724
1	6	1	1	1	12	0.465	1	0.62
1	6	1	1	1	13	0.321	1	0.428
1	6	1	1	2	1	0.468	1	0.624
1	6	1	1	2	2	0.331	1	0.441333
1	6	1	1	2	3	0.421	1	0.561333
1	6	1	1	2	4	0.370	1	0.493333
1	6	1	1	2	5	0.465	1	0.62
1	6	1	1	2	6	0.306	1	0.408
1	6	1	1	2	7	0.320	1	0.426666
1	6	1	1	2	8	0.534	1	0.712
1	6	1	1	2	9	0.340	1	0.453333
1	6	1	1	2	10	0.364	1	0.485333
1	6	1	1	2	11	0.334	1	0.445333
1	6	1	1	2	12	0.361	1	0.481333
1	6	1	1	2	13	0.444	1	0.592
1	6	1	1	3	1	0.476	1	0.634666
1	6	1	1	3	2	0.750	1	1
1	6	1	1	3	3	0.562	1	0.749333
1	6	1	1	3	4	0.238	1	0.317333
1	6	1	1	3	5	0.451	1	0.601333
1	6	1	1	3	6	0.359	1	0.478666
1	6	1	1	3	7	0.591	1	0.788
1	6	1	1	3	8	0.392	1	0.522666
1	6	1	1	3	9	0.414	1	0.552
1	6	1	1	3	10	0.619	1	0.825333
1	6	1	1	3	11	0.521	1	0.694666
1	6	1	1	3	12	0.564	1	0.752
1	6	1	1	3	13	0.384	1	0.512

A	B	C	D	E	F	G	H	I
1	6	1	2	1	1	0.611	1	0.489191
1	6	1	2	1	2	1.045	1	0.836669
1	6	1	2	1	3	0.575	1	0.460368
1	6	1	2	1	4	0.356	1	0.285028
1	6	1	2	1	5	0.380	1	0.304243
1	6	1	2	1	6	0.660	1	0.528422
1	6	1	2	1	7	0.669	1	0.535628
1	6	1	2	1	8	0.761	1	0.609287
1	6	1	2	1	9	0.758	1	0.606885
1	6	1	2	1	10	0.439	1	0.351481
1	6	1	2	1	11	1.249	1	1
1	6	1	2	1	12	0.681	1	0.545236
1	6	1	2	1	13	0.495	1	0.396317
1	6	1	2	2	1	0.384	1	0.307445
1	6	1	2	2	2	1.023	1	0.819055
1	6	1	2	2	3	0.439	1	0.351481
1	6	1	2	2	4	0.801	1	0.641313
1	6	1	2	2	5	0.447	1	0.357886
1	6	1	2	2	6	0.629	1	0.503602
1	6	1	2	2	7	0.742	1	0.594075
1	6	1	2	2	8	0.530	1	0.424339
1	6	1	2	2	9	0.436	1	0.349079
1	6	1	2	2	10	0.333	1	0.266613
1	6	1	2	2	11	0.706	1	0.565252
1	6	1	2	2	12	0.481	1	0.385108
1	6	1	2	2	13	0.449	1	0.359487
1	6	1	2	3	1	0.594	1	0.475580
1	6	1	2	3	2	0.362	1	0.289831
1	6	1	2	3	3	0.746	1	0.597277
1	6	1	2	3	4	0.337	1	0.269815
1	6	1	2	3	5	0.742	1	0.594075
1	6	1	2	3	6	0.379	1	0.303442
1	6	1	2	3	7	0.481	1	0.385108
1	6	1	2	3	8	0.361	1	0.289031
1	6	1	2	3	9	1.026	1	0.821457
1	6	1	2	3	10	0.590	1	0.472377
1	6	1	2	3	11	0.693	1	0.554843
1	6	1	2	3	12	0.425	1	0.340272
1	6	1	2	3	13	0.776	1	0.621297
1	6	1	3	1	1	0.387	1	0.205851
1	6	1	3	1	2	0.927	1	0.493085
1	6	1	3	1	3	0.735	1	0.390957
1	6	1	3	1	4	0.995	1	0.529255
1	6	1	3	1	5	0.605	1	0.321808
1	6	1	3	1	6	0.731	1	0.388829
1	6	1	3	1	7	0.955	1	0.507978
1	6	1	3	1	8	0.992	1	0.527659
1	6	1	3	1	9	1.437	1	0.764361
1	6	1	3	1	10	0.513	1	0.272872
1	6	1	3	1	11	1.257	1	0.668617
1	6	1	3	1	12	1.056	1	0.561702
1	6	1	3	1	13	0.930	1	0.494680
1	6	1	3	2	1	0.587	1	0.312234
1	6	1	3	2	2	0.784	1	0.417021
1	6	1	3	2	3	1.053	1	0.560106
1	6	1	3	2	4	0.865	1	0.460106
1	6	1	3	2	5	0.608	1	0.323404
1	6	1	3	2	6	0.774	1	0.411702
1	6	1	3	2	7	0.888	1	0.472340
1	6	1	3	2	8	0.607	1	0.322872
1	6	1	3	2	9	0.708	1	0.376595
1	6	1	3	2	10	1.121	1	0.596276
1	6	1	3	2	11	1.043	1	0.554787
1	6	1	3	2	12	1.074	1	0.571276
1	6	1	3	2	13	0.927	1	0.493085
1	6	1	3	3	1	1.096	1	0.582978
1	6	1	3	3	2	1.170	1	0.622340
1	6	1	3	3	3	1.060	1	0.563829
1	6	1	3	3	4	1.769	1	0.940957
1	6	1	3	3	5	1.254	1	0.667021
1	6	1	3	3	6	1.186	1	0.630851
1	6	1	3	3	7	1.454	1	0.773404
1	6	1	3	3	8	0.470	1	0.25
1	6	1	3	3	9	0.872	1	0.463829
1	6	1	3	3	10	1.264	1	0.672340
1	6	1	3	3	11	0.802	1	0.426595
1	6	1	3	3	12	1.880	1	1
1	6	1	3	3	13	1.815	1	0.965425
1	6	2	1	1	1	0.166	1	0.221333
1	6	2	1	1	2	0.183	1	0.244
1	6	2	1	1	3	0.170	1	0.226666
1	6	2	1	1	4	0.151	1	0.201333
1	6	2	1	1	5	0.161	1	0.214666
1	6	2	1	1	6	0.302	1	0.402666
1	6	2	1	1	7	0.274	1	0.365333
1	6	2	1	1	8	0.233	1	0.310666
1	6	2	1	1	9	0.193	1	0.257333
1	6	2	1	1	10	0.136	1	0.181333
1	6	2	1	1	11	0.233	1	0.310666
1	6	2	1	1	12	0.146	1	0.194666
1	6	2	1	1	13	0.178	1	0.237333
1	6	2	1	2	1	0.179	1	0.238666
1	6	2	1	2	2	0.312	1	0.416
1	6	2	1	2	3	0.319	1	0.425333
1	6	2	1	2	4	0.153	1	0.204
1	6	2	1	2	5	0.112	1	0.149333
1	6	2	1	2	6	0.265	1	0.353333
1	6	2	1	2	7	0.323	1	0.430666
1	6	2	1	2	8	0.269	1	0.358666
1	6	2	1	2	9	0.229	1	0.305333
1	6	2	1	2	10	0.133	1	0.177333
1	6	2	1	2	11	0.256	1	0.341333
1	6	2	1	2	12	0.209	1	0.278666
1	6	2	1	3	1	0.177	1	0.236
1	6	2	1	3	2	0.220	1	0.293333
1	6	2	1	3	3	0.307	1	0.409333
1	6	2	1	3	4	0.194	1	0.258666
1	6	2	1	3	5	0.170	1	0.226666
1	6	2	1	3	6	0.185	1	0.246666
1	6	2	1	3	7	0.218	1	0.290666
1	6	2	1	3	8	0.168	1	0.224
1	6	2	1	3	9	0.349	1	0.465333
1	6	2	1	3	10	0.209	1	0.278666
1	6	2	1	3	11	0.206	1	0.274666
1	6	2	1	3	12	0.260	1	0.346666
1	6	2	1	3	13	0.167	1	0.222666
1	6	2	2	1	1	0.364	1	0.291433
1	6	2	2	1	2	0.394	1	0.315452
1	6	2	2	1	3	0.412	1	0.329863
1	6	2	2	1	4	0.328	1	0.262610
1	6	2	2	1	5	0.220	1	0.176140
1	6	2	2	1	6	0.422	1	0.337870
1	6	2	2	1	7	0.249	1	0.199359
1	6	2	2	1	8	0.250	1	0.200160
1	6	2	2	1	9	0.441	1	0.353082
1	6	2	2	1	10	0.244	1	0.195356
1	6	2	2	1	11	0.469	1	0.375500
1	6	2	2	1	12	0.176	1	0.140912
1	6	2	2	1	13	0.363	1	0.290632
1	6	2	2	2	1	0.169	1	0.135308
1	6	2	2	2	2	0.435	1	0.348278
1	6	2	2	2	3	0.349	1	0.279423

A	B	C	D	E	F	G	H	I
1	6	2	2	2	4	0.373	1	0.298638
1	6	2	2	2	5	0.536	1	0.429143
1	6	2	2	2	6	0.232	1	0.185748
1	6	2	2	2	7	0.323	1	0.258606
1	6	2	2	2	8	0.227	1	0.181745
1	6	2	2	2	9	0.261	1	0.208967
1	6	2	2	2	10	0.650	1	0.520416
1	6	2	2	2	11	0.258	1	0.206565
1	6	2	2	2	12	0.451	1	0.361088
1	6	2	2	2	13	0.534	1	0.427542
1	6	2	2	3	1	0.211	1	0.168935
1	6	2	2	3	2	0.513	1	0.410728
1	6	2	2	3	3	0.229	1	0.183346
1	6	2	2	3	4	0.346	1	0.277021
1	6	2	2	3	5	0.227	1	0 181745
1	6	2	2	3	6	0.403	1	0.322658
1	6	2	2	3	7	0.354	1	0.283426
1	6	2	2	3	8	0.223	1	0.178542
1	6	2	2	3	9	0.152	1	0.121697
1	6	2	2	3	10	0.498	1	0.398718
1	6	2	2	3	11	0.237	1	0.189751
1	6	2	2	3	12	0.223	1	0.178542
1	6	2	2	3	13	0.196	1	0.156925
1	6	2	3	1	1	0.119	1	0.063297
1	6	2	3	1	2	0.346	1	0.184042
1	6	2	3	1	3	0.545	1	0.289893
1	6	2	3	1	4	0.298	1	0.158510
1	6	2	3	1	5	0.233	1	0.123936
1	6	2	3	1	6	0.203	1	0.107978
1	6	2	3	1	7	0.432	1	0.229787
1	6	2	3	1	8	0.464	1	0.246808
1	6	2	3	1	9	0.168	1	0.089361
1	6	2	3	1	10	0.350	1	0.186170
1	6	2	3	1	11	0.442	1	0.235106
1	6	2	3	1	12	0.215	1	0.114361
1	6	2	3	1	13	0.500	1	0.265957
1	6	2	3	2	1	0.339	1	0.180319
1	6	2	3	2	2	0.398	1	0.211702
1	6	2	3	2	3	0.208	1	0.110638
1	6	2	3	2	4	0.388	1	0.206382
1	6	2	3	2	5	0.404	1	0.214893
1	6	2	3	2	6	0.419	1	0.222872
1	6	2	3	2	7	0.684	1	0.363829
1	6	2	3	2	8	0.238	1	0.126595
1	6	2	3	2	9	0.277	1	0.147340
1	6	2	3	2	10	0.201	1	0.106914
1	6	2	3	2	11	0.243	1	0.129255
1	6	2	3	2	12	0.527	1	0.280319
1	6	2	3	2	13	0.510	1	0.271276
1	6	2	3	3	1	0.315	1	0.167553
1	6	2	3	3	2	0.512	1	0.272340
1	6	2	3	3	3	0.283	1	0.150531
1	6	2	3	3	4	0.278	1	0.147872
1	6	2	3	3	5	0.330	1	0.175531
1	6	2	3	3	6	0.255	1	0.135638
1	6	2	3	3	7	0.288	1	0.153191
1	6	2	3	3	8	0.261	1	0.138829
1	6	2	3	3	9	0.312	1	0.165957
1	6	2	3	3	10	0.555	1	0.295212
1	6	2	3	3	11	0.177	1	0.094148
1	6	2	3	3	12	0.432	1	0.229787
1	6	2	3	3	13	0.367	1	0.195212

Appendix 9 - Table 1

A - Phytotron Room

B - Species:
  - 1 - *Agropyron dasystachyum*
  - 2 - *Agropyron trachycaulum*
  - 3 - *Bromus inermis*
  - 4 - *Stipa comata*
  - 5 - *Stipa curtiseta*
  - 6 - *Stipa viridula*

C - Competitive Level:
  - 1 - Intraspecific
  - 2 - Interspecific with *Bromus inermis*

D - Treatment:
  - 1 - Dry
  - 2 - Moist
  - 3 - Wet

E - Replicate Number

F - Individual Sample Number

G - Dry Weight (g)

H - Flowering
  - 1 - No
  - 2 - Yes

I - Standardization Transformation
(weights of individuals in each treatment and competitive level divided by the largest individual)

Table 2. Individual data from competition experiment including interspecific data for Bromus inermis.

A	B	C	D	E	F	G	H
1	1	3	1	1	1	0.399	1
1	1	3	1	1	2	0.403	1
1	1	3	1	1	3	0.584	1
1	1	3	1	1	4	0.738	1
1	1	3	1	1	5	0.266	1
1	1	3	1	1	6	0.713	1
1	1	3	1	1	7	0.427	1
1	1	3	1	1	8	0.264	1
1	1	3	1	1	9	0.271	1
1	1	3	1	1	10	0.793	1
1	1	3	1	1	11	0.298	1
1	1	3	1	1	12	0.724	1
1	1	3	1	1	13	0.690	1
2	1	3	1	2	1	0.460	1
2	1	3	1	2	2	0.334	1
2	1	3	1	2	3	0.731	1
2	1	3	1	2	4	0.535	1
2	1	3	1	2	5	1.129	1
2	1	3	1	2	6	0.730	1
2	1	3	1	2	7	0.441	1
2	1	3	1	2	8	0.491	1
2	1	3	1	2	9	1.141	1
2	1	3	1	2	10	0.903	1
2	1	3	1	2	11	0.995	1
2	1	3	1	2	12	0.786	1
2	1	3	1	2	13	0.394	1
2	1	3	1	3	1	0.656	1
2	1	3	1	3	2	0.805	1
2	1	3	1	3	3	0.761	1
2	1	3	1	3	4	1.154	1
2	1	3	1	3	5	0.393	1
2	1	3	1	3	6	0.497	1
2	1	3	1	3	7	0.538	1
2	1	3	1	3	8	0.661	1
2	1	3	1	3	9	0.343	1
2	1	3	1	3	10	0.654	1
2	1	3	1	3	11	0.393	1
2	1	3	1	3	12	1.418	1
2	1	3	1	3	13	0.840	1
1	1	3	2	1	1	1.343	1
1	1	3	2	1	2	1.002	1
1	1	3	2	1	3	0.312	1
1	1	3	2	1	4	0.990	1
1	1	3	2	1	5	0.674	1
1	1	3	2	1	6	0.730	1
1	1	3	2	1	7	1.067	1
1	1	3	2	1	8	1.181	1
1	1	3	2	1	9	1.824	1
1	1	3	2	1	10	1.185	1
1	1	3	2	1	11	1.014	1
1	1	3	2	1	12	1.340	1
1	1	3	2	1	13	0.998	1
2	1	3	2	2	1	1.359	1
2	1	3	2	2	2	0.690	1
2	1	3	2	2	3	1.195	1
2	1	3	2	2	4	1.705	1
2	1	3	2	2	5	1.612	1
2	1	3	2	2	6	0.469	1
2	1	3	2	2	7	1.402	1
2	1	3	2	2	8	0.965	1
2	1	3	2	2	9	1.162	1
2	1	3	2	2	10	1.233	1
2	1	3	2	2	11	1.148	1
2	1	3	2	2	12	1.761	1
2	1	3	2	2	13	0.983	1
2	1	3	2	3	1	0.877	1
2	1	3	2	3	2	1.131	1
2	1	3	2	3	3	1.774	1
2	1	3	2	3	4	1.081	1
2	1	3	2	3	5	1.732	1
2	1	3	2	3	6	0.940	1
2	1	3	2	3	7	0.292	1
2	1	3	2	3	8	1.859	1
2	1	3	2	3	9	1.537	1
2	1	3	2	3	10	1.108	1
2	1	3	2	3	11	1.229	1
2	1	3	2	3	12	1.186	1
2	1	3	2	3	13	0.752	1
1	1	3	3	1	1	2.829	2
1	1	3	3	1	2	0.721	1
1	1	3	3	1	3	1.835	1
1	1	3	3	1	4	3.558	1
1	1	3	3	1	5	1.824	1
1	1	3	3	1	6	1.222	1
1	1	3	3	1	7	2.199	1
1	1	3	3	1	8	0.902	1
1	1	3	3	1	9	2.440	1
1	1	3	3	1	10	2.195	1
1	1	3	3	1	11	1.105	1
1	1	3	3	1	12	1.007	1
1	1	3	3	1	13	1.651	1
2	1	3	3	2	1	1.258	1
2	1	3	3	2	2	2.443	1
2	1	3	3	2	3	1.738	1
2	1	3	3	2	4	2.256	1
2	1	3	3	2	5	2.096	1
2	1	3	3	2	6	1.829	1
2	1	3	3	2	7	1.703	1
2	1	3	3	2	8	2.020	1
2	1	3	3	2	9	1.071	1
2	1	3	3	2	10	0.869	1
2	1	3	3	2	11	2.394	1
2	1	3	3	2	12	1.814	1
2	1	3	3	2	13	1.403	1
2	1	3	3	3	1	1.788	1
2	1	3	3	3	2	1.340	1
2	1	3	3	3	3	2.170	1
2	1	3	3	3	4	1.207	1
2	1	3	3	3	5	1.137	1
2	1	3	3	3	6	2.852	1
2	1	3	3	3	7	1.796	1
2	1	3	3	3	8	2.947	1
2	1	3	3	3	9	1.485	1
2	1	3	3	3	10	1.841	1
2	1	3	3	3	11	1.907	1
2	1	3	3	3	12	1.550	1
2	1	3	3	3	13	1.078	1
1	2	3	1	1	1	0.436	1
1	2	3	1	1	2	0.633	1
1	2	3	1	1	3	0.359	1
1	2	3	1	1	4	0.917	1
1	2	3	1	1	5	0.780	1
1	2	3	1	1	6	0.840	1
1	2	3	1	1	7	0.372	1
1	2	3	1	1	8	0.807	1
1	2	3	1	1	9	0.506	1
1	2	3	1	1	10	0.346	1
1	2	3	1	1	11	0.507	1
1	2	3	1	1	12	0.943	1

A	B	C	D	E	F	G	H
1	2	3	1	1	13	0.487	1
1	2	3	1	2	1	0.634	1
1	2	3	1	2	2	1.134	1
1	2	3	1	2	3	0.512	1
1	2	3	1	2	4	0.185	1
1	2	3	1	2	5	0.377	1
1	2	3	1	2	6	0.514	1
1	2	3	1	2	7	0.129	1
1	2	3	1	2	8	0.595	1
1	2	3	1	2	9	0.645	1
1	2	3	1	2	10	0.680	1
1	2	3	1	2	11	0.678	1
1	2	3	1	2	12	0.483	1
1	2	3	1	2	13	0.920	1
2	2	3	1	3	1	0.762	1
2	2	3	1	3	2	0.541	1
2	2	3	1	3	3	0.704	1
2	2	3	1	3	4	0.681	1
2	2	3	1	3	5	1.112	1
2	2	3	1	3	6	0.936	1
2	2	3	1	3	7	0.609	1
2	2	3	1	3	8	0.910	1
2	2	3	1	3	9	0.794	1
2	2	3	1	3	10	0.642	1
2	2	3	1	3	11	0.488	1
2	2	3	1	3	12	0.517	1
2	2	3	1	3	13	0.108	1
2	2	3	2	1	1	1.330	1
2	2	3	2	1	2	0.573	1
2	2	3	2	1	3	1.051	1
2	2	3	2	1	4	1.721	1
2	2	3	2	1	5	0.795	1
2	2	3	2	1	6	1.001	1
2	2	3	2	1	7	0.998	1
2	2	3	2	1	8	1.257	1
2	2	3	2	1	9	1.699	1
2	2	3	2	1	10	0.467	1
2	2	3	2	1	11	0.841	1
2	2	3	2	1	12	0.334	1
1	2	3	2	2	1	1.442	1
1	2	3	2	2	2	1.152	1
1	2	3	2	2	3	0.923	1
1	2	3	2	2	4	1.106	1
1	2	3	2	2	5	0.874	1
1	2	3	2	2	6	1.372	1
1	2	3	2	2	7	0.845	1
1	2	3	2	2	8	1.059	1
1	2	3	2	2	9	0.600	1
1	2	3	2	2	10	1.116	1
1	2	3	2	2	11	0.913	1
1	2	3	2	2	12	0.927	1
1	2	3	2	2	13	0.805	1
2	2	3	2	3	1	1.774	1
2	2	3	2	3	2	1.322	1
2	2	3	2	3	3	0.829	1
2	2	3	2	3	4	0.768	1
2	2	3	2	3	5	1.485	1
2	2	3	2	3	6	1.229	1
2	2	3	2	3	7	0.862	1
2	2	3	2	3	8	1.038	1
2	2	3	2	3	9	1.542	1
2	2	3	2	3	10	1.372	1
2	2	3	2	3	11	0.852	1
2	2	3	2	3	12	1.118	1
2	2	3	2	3	13	1.657	1
1	2	3	3	1	1	2.510	1
1	2	3	3	1	2	1.028	1
1	2	3	3	1	3	0.851	1
1	2	3	3	1	4	1.148	1
1	2	3	3	1	5	2.038	1
1	2	3	3	1	6	1.181	1
1	2	3	3	1	7	1.322	1
1	2	3	3	1	8	1.555	1
1	2	3	3	1	9	1.981	1
1	2	3	3	1	10	1.092	1
1	2	3	3	1	11	1.659	1
1	2	3	3	1	12	1.990	1
1	2	3	3	1	13	2.403	1
1	2	3	3	2	1	1.701	1
1	2	3	3	2	2	1.570	1
1	2	3	3	2	3	1.948	1
1	2	3	3	2	4	1.627	1
1	2	3	3	2	5	1.745	1
1	2	3	3	2	6	0.669	1
1	2	3	3	2	7	1.506	1
1	2	3	3	2	8	2.656	1
1	2	3	3	2	9	2.050	1
1	2	3	3	2	10	0.732	1
1	2	3	3	2	11	1.902	1
1	2	3	3	2	12	1.200	1
1	2	3	3	2	13	1.692	1
2	2	3	3	3	1	1.803	1
2	2	3	3	3	2	2.268	1
2	2	3	3	3	3	1.845	1
2	2	3	3	3	4	2.234	1
2	2	3	3	3	5	1.811	1
2	2	3	3	3	6	2.118	1
2	2	3	3	3	7	2.587	1
2	2	3	3	3	8	2.228	1
2	2	3	3	3	9	2.253	1
2	2	3	3	3	10	2.579	1
2	2	3	3	3	11	1.963	1
2	2	3	3	3	12	1.107	1
2	2	3	3	3	13	1.783	1
1	4	3	1	1	1	0.708	1
1	4	3	1	1	2	0.772	1
1	4	3	1	1	3	0.612	1
1	4	3	1	1	4	0.395	1
1	4	3	1	1	5	0.201	1
1	4	3	1	1	6	0.369	1
1	4	3	1	1	7	0.419	1
1	4	3	1	1	8	0.69	1
1	4	3	1	1	9	0.786	1
1	4	3	1	1	10	0.858	1
1	4	3	1	1	11	0.433	1
1	4	3	1	1	12	0.831	1
1	4	3	1	1	13	0.49	1
1	4	3	1	2	1	0.885	1
1	4	3	1	2	2	0.521	1
1	4	3	1	2	3	1.095	1
1	4	3	1	2	4	0.793	1
1	4	3	1	2	5	1.336	1
1	4	3	1	2	6	0.595	1
1	4	3	1	2	7	0.209	1
1	4	3	1	2	8	0.114	1
1	4	3	1	2	9	0.325	1
1	4	3	1	2	10	0.078	1
1	4	3	1	2	11	0.609	1
1	4	3	1	2	12	0.441	1
1	4	3	1	2	13	0.806	1
1	4	3	1	3	1	0.359	1
1	4	3	1	3	2	0.583	1

A	B	C	D	E	F	G	H
1	4	3	1	3	3	0.578	1
1	4	3	1	3	4	0.637	1
1	4	3	1	3	5	0.728	1
1	4	3	1	3	6	0.836	1
1	4	3	1	3	7	0.633	1
1	4	3	1	3	8	0.821	1
1	4	3	1	3	9	0.56	1
1	4	3	1	3	10	0.561	1
1	4	3	1	3	11	0.945	1
1	4	3	1	3	12	0.675	1
1	4	3	1	3	13	0.704	1
1	4	3	2	1	1	1.037	1
1	4	3	2	1	2	2.264	1
1	4	3	2	1	3	0.668	1
1	4	3	2	1	4	1.697	1
1	4	3	2	1	5	1.929	1
1	4	3	2	1	6	1.886	1
1	4	3	2	1	7	0.674	1
1	4	3	2	1	8	1.477	1
1	4	3	2	1	9	1.664	1
1	4	3	2	1	10	1.86	1
1	4	3	2	1	11	1.863	1
1	4	3	2	1	12	1.721	1
1	4	3	2	1	13	1.51	1
1	4	3	2	2	1	1.859	1
1	4	3	2	2	2	0.896	1
1	4	3	2	2	3	1.203	1
1	4	3	2	2	4	0.552	1
1	4	3	2	2	5	1.605	1
1	4	3	2	2	6	1.821	1
1	4	3	2	2	7	1.714	1
1	4	3	2	2	8	1.247	1
1	4	3	2	2	9	0.312	1
1	4	3	2	2	10	2.132	1
1	4	3	2	2	11	1.921	1
1	4	3	2	2	12	1.162	1
1	4	3	2	2	13	1.709	1
1	4	3	2	3	1	1.009	1
1	4	3	2	3	2	1.127	1
1	4	3	2	3	3	1.626	1
1	4	3	2	3	4	1.739	1
1	4	3	2	3	5	1.625	1
1	4	3	2	3	6	0.895	1
1	4	3	2	3	7	1.566	1
1	4	3	2	3	8	2.081	1
1	4	3	2	3	9	2.239	1
1	4	3	2	3	10	1.753	1
1	4	3	2	3	11	2.409	1
1	4	3	2	3	12	3.885	1
1	4	3	2	3	13	2.128	1
1	4	3	3	1	1	1.036	1
1	4	3	3	1	2	1.3	1
1	4	3	3	1	3	1.349	1
1	4	3	3	1	4	0.72	1
1	4	3	3	1	5	2.316	1
1	4	3	3	1	6	1.529	1
1	4	3	3	1	7	0.994	1
1	4	3	3	1	8	1.223	1
1	4	3	3	1	9	1.239	2
1	4	3	3	1	10	1.628	1
1	4	3	3	1	11	1.863	1
1	4	3	3	1	12	0.35	1
1	4	3	3	1	13	2.01	1
1	4	3	3	2	1	2.234	1
1	4	3	3	2	2	1.573	1
1	4	3	3	2	3	1.995	1
1	4	3	3	2	4	1.958	1
1	4	3	3	2	5	1.066	1
1	4	3	3	2	6	1.146	1
1	4	3	3	2	7	2.093	1
1	4	3	3	2	8	1.904	1
1	4	3	3	2	9	2.744	1
1	4	3	3	2	10	2.399	1
1	4	3	3	2	11	1.421	1
1	4	3	3	2	12	1.238	1
1	4	3	3	2	13	2.128	1
1	4	3	3	3	1	1.639	1
1	4	3	3	3	2	1.396	1
1	4	3	3	3	3	1.557	1
1	4	3	3	3	4	2.777	1
1	4	3	3	3	5	1.431	1
1	4	3	3	3	6	4.058	1
1	4	3	3	3	7	2.664	1
1	4	3	3	3	8	1.904	1
1	4	3	3	3	9	1.101	1
1	4	3	3	3	10	1.81	1
1	4	3	3	3	11	0.723	1
1	4	3	3	3	12	0.764	1
1	4	3	3	3	13	1.375	1
1	5	3	1	1	1	0.230	1
1	5	3	1	1	2	1.010	1
1	5	3	1	1	3	0.952	1
1	5	3	1	1	4	0.508	1
1	5	3	1	1	5	0.341	1
1	5	3	1	1	6	0.351	1
1	5	3	1	1	7	0.458	1
1	5	3	1	1	8	0.925	1
1	5	3	1	1	9	0.674	1
1	5	3	1	1	10	0.818	1
1	5	3	1	1	11	0.796	1
1	5	3	1	1	12	0.565	1
1	5	3	1	1	13	0.433	1
2	5	3	1	2	1	0.677	1
2	5	3	1	2	2	0.599	1
2	5	3	1	2	3	0.289	1
2	5	3	1	2	4	1.317	1
2	5	3	1	2	5	1.189	1
2	5	3	1	2	6	0.676	1
2	5	3	1	2	7	0.921	1
2	5	3	1	2	8	0.532	1
2	5	3	1	2	9	0.997	1
2	5	3	1	2	10	0.570	1
2	5	3	1	2	11	0.522	1
2	5	3	1	2	12	1.118	1
2	5	3	1	2	13	0.478	1
2	5	3	1	3	1	1.045	1
2	5	3	1	3	2	1.027	1
2	5	3	1	3	3	0.596	1
2	5	3	1	3	4	0.680	1
2	5	3	1	3	5	0.648	1
2	5	3	1	3	6	1.212	1
2	5	3	1	3	7	1.743	1
2	5	3	1	3	8	0.640	1
2	5	3	1	3	9	1.131	1
2	5	3	1	3	10	0.567	1
2	5	3	1	3	11	0.853	1
2	5	3	1	3	12	1.267	1
2	5	3	1	3	13	0.898	1
1	5	3	2	1	1	0.728	1
1	5	3	2	1	2	1.085	1
1	5	3	2	1	3	0.280	1
1	5	3	2	1	4	1.481	1
1	5	3	2	1	5	2.028	1
1	5	3	2	1	6	1.619	1
1	5	3	2	1	7	1.354	1
1	5	3	2	1	8	0.523	1
1	5	3	2	1	9	1.766	1
1	5	3	2	1	10	1.053	1
1	5	3	2	1	11	1.115	1
1	5	3	2	1	12	1.619	1
1	5	3	2	1	13	1.214	1
1	5	3	2	2	1	1.262	1
1	5	3	2	2	2	0.997	1
1	5	3	2	2	3	1.511	1
1	5	3	2	2	4	2.170	1
1	5	3	2	2	5	1.278	1
1	5	3	2	2	6	0.802	1
1	5	3	2	2	7	0.817	1
1	5	3	2	2	8	0.955	1
1	5	3	2	2	9	1.398	1
1	5	3	2	2	10	1.360	1
1	5	3	2	2	11	1.888	1
1	5	3	2	2	12	1.681	1
1	5	3	2	2	13	1.488	1
2	5	3	2	3	1	1.877	1
2	5	3	2	3	2	1.397	1
2	5	3	2	3	3	1.570	1
2	5	3	2	3	4	1.425	1
2	5	3	2	3	5	0.931	1
2	5	3	2	3	6	0.816	1
2	5	3	2	3	7	1.021	1
2	5	3	2	3	8	1.426	1
2	5	3	2	3	9	1.630	1
2	5	3	2	3	10	1.107	1
2	5	3	2	3	11	0.704	1
2	5	3	2	3	12	0.839	1
2	5	3	2	3	13	0.607	1
1	5	3	3	1	1	1.174	1
1	5	3	3	1	2	1.615	1
1	5	3	3	1	3	1.276	1
1	5	3	3	1	4	3.194	1
1	5	3	3	1	5	2.059	1
1	5	3	3	1	6	0.593	1
1	5	3	3	1	7	1.912	1
1	5	3	3	1	8	0.365	1
1	5	3	3	1	9	2.915	1
1	5	3	3	1	10	2.288	1
1	5	3	3	1	11	1.899	1
1	5	3	3	1	12	2.198	1
1	5	3	3	1	13	2.646	1
1	5	3	3	2	1	1.955	1
1	5	3	3	2	2	3.643	1
1	5	3	3	2	3	2.474	1
1	5	3	3	2	4	1.337	1
1	5	3	3	2	5	3.526	1
1	5	3	3	2	6	1.420	1
1	5	3	3	2	7	2.161	1
1	5	3	3	2	8	1.835	1
1	5	3	3	2	9	1.332	1
1	5	3	3	2	10	3.862	1
1	5	3	3	2	11	2.553	1
1	5	3	3	2	12	1.826	1
1	5	3	3	2	13	2.523	1
2	5	3	3	3	1	1.201	1
2	5	3	3	3	2	1.607	1
2	5	3	3	3	3	0.524	1
2	5	3	3	3	4	0.944	1
2	5	3	3	3	5	1.413	1

A	B	C	D	E	F	G	H
2	5	3	3	3	6	1.184	1
2	5	3	3	3	7	2.027	1
2	5	3	3	3	8	1.895	1
2	5	3	3	3	9	1.554	1
2	5	3	3	3	10	1.588	1
2	5	3	3	3	11	0.860	1
2	5	3	3	3	12	1.508	1
2	5	3	3	3	13	0.881	1
1	6	3	1	1	1	0.68	1
1	6	3	1	1	2	0.707	1
1	6	3	1	1	3	0.487	1
1	6	3	1	1	4	0.366	1
1	6	3	1	1	5	0.255	1
1	6	3	1	1	6	0.871	1
1	6	3	1	1	7	0.66	1
1	6	3	1	1	8	0.074	1
1	6	3	1	1	9	0.842	1
1	6	3	1	1	10	1.136	1
1	6	3	1	1	11	0.817	1
1	6	3	1	1	12	0.632	1
1	6	3	1	1	13	0.446	1
1	6	3	1	2	1	1.073	1
1	6	3	1	2	2	0.262	1
1	6	3	1	2	3	0.657	1
1	6	3	1	2	4	0.398	1
1	6	3	1	2	5	0.783	1
1	6	3	1	2	6	0.656	1
1	6	3	1	2	7	0.155	1
1	6	3	1	2	8	0.708	1
1	6	3	1	2	9	0.557	1
1	6	3	1	2	10	0.559	1
1	6	3	1	2	11	1.183	1
1	6	3	1	2	12	0.842	1
1	6	3	1	2	13	0.356	1
1	6	3	1	3	1	0.582	1
1	6	3	1	3	2	0.581	1
1	6	3	1	3	3	0.679	1
1	6	3	1	3	4	0.559	1
1	6	3	1	3	5	0.409	1
1	6	3	1	3	6	0.294	1
1	6	3	1	3	7	0.149	1
1	6	3	1	3	8	0.811	1
1	6	3	1	3	9	0.509	1
1	6	3	1	3	10	0.222	1
1	6	3	1	3	11	0.406	1
1	6	3	1	3	12	0.76	1
1	6	3	1	3	13	1.077	1
1	6	3	2	1	1	1.431	1
1	6	3	2	1	2	1.161	1
1	6	3	2	1	3	1.357	1
1	6	3	2	1	4	0.483	1
1	6	3	2	1	5	1.63	1
1	6	3	2	1	6	0.986	1
1	6	3	2	1	7	0.676	1
1	6	3	2	1	8	1.192	1
1	6	3	2	1	9	1.208	1
1	6	3	2	1	10	1.353	1
1	6	3	2	1	11	1.582	1
1	6	3	2	1	12	0.921	1
1	6	3	2	1	13	1.054	1
1	6	3	2	2	1	0.065	1
1	6	3	2	2	2	1.576	1
1	6	3	2	2	3	1.373	1
1	6	3	2	2	4	1.478	1
1	6	3	2	2	5	1.552	1
1	6	3	2	2	6	0.102	1
1	6	3	2	2	7	1.426	1
1	6	3	2	2	8	1.561	1
1	6	3	2	2	9	2.323	1
1	6	3	2	2	10	1.084	1
1	6	3	2	2	11	1.26	1
1	6	3	2	2	12	1.542	1
1	6	3	2	2	13	1.311	1
1	6	3	2	3	1	1.923	1
1	6	3	2	3	2	0.962	1
1	6	3	2	3	3	0.262	1
1	6	3	2	3	4	2.387	1
1	6	3	2	3	5	1.551	1
1	6	3	2	3	6	1.26	1
1	6	3	2	3	7	1.14	1
1	6	3	2	3	8	1.749	1
1	6	3	2	3	9	1.12	1
1	6	3	2	3	10	0.996	1
1	6	3	2	3	11	0.849	1
1	6	3	2	3	12	0.815	1
1	6	3	2	3	13	0.715	1
1	6	3	3	1	1	1.101	1
1	6	3	3	1	2	1.714	1
1	6	3	3	1	3	1.466	1
1	6	3	3	1	4	2.423	1
1	6	3	3	1	5	0.948	1
1	6	3	3	1	6	0.456	1
1	6	3	3	1	7	1.777	1
1	6	3	3	1	8	1.428	1
1	6	3	3	1	9	0.88	1
1	6	3	3	1	10	0.749	1
1	6	3	3	1	11	0.32	1
1	6	3	3	1	12	0.927	1
1	6	3	3	1	13	1.209	1
1	6	3	3	2	1	2.092	1
1	6	3	3	2	2	1.373	1
1	6	3	3	2	3	0.941	1
1	6	3	3	2	4	1.318	1
1	6	3	3	2	5	1.759	1
1	6	3	3	2	6	2.09	1
1	6	3	3	2	7	1.939	1
1	6	3	3	2	8	1.555	1
1	6	3	3	2	9	0.969	1
1	6	3	3	2	10	1.337	1
1	6	3	3	2	11	2.175	1
1	6	3	3	2	12	1.106	1
1	6	3	3	2	13	1.854	1
1	6	3	3	3	1	1.67	1
1	6	3	3	3	2	1.488	1
1	6	3	3	3	3	1.188	1
1	6	3	3	3	4	1.04	1
1	6	3	3	3	5	2.631	1
1	6	3	3	3	6	1.546	1
1	6	3	3	3	7	3.076	1
1	6	3	3	3	8	2.477	1
1	6	3	3	3	9	1.194	1
1	6	3	3	3	10	1.133	1
1	6	3	3	3	11	0.609	1
1	6	3	3	3	12	1.294	1
1	6	3	3	3	13	1.484	1

Appendix 9 - Table 2

A - Phytotron Room

B - Species (Native Competitor):
  1 - *Agropyron dasystachyum*
  2 - *Agropyron trachycaulum*
  4 - *Stipa comata*
  5 - *Stipa curtiseta*
  6 - *Stipa viridula*

C - Competitive Level:
  3 - Interspecific

D - Treatment:
  1 - Dry
  2 - Moist
  3 - Wet

E - Replicate Number

F - Individual Sample Number

G - Dry Weight (g)

H - Flowering
  1 - No
  2 - Yes